COAL AGE

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Let the Old Year Die

By R. Dawson Hall

THE NEW YEAR is the time to clear the books, to forget the past and take a bright, fresh view of things. Too many of us carry over glum looks and bitter memories into the New Year as part of our stock in trade. They will surely never pay either wages or dividends. Like bad debts, the sooner we write them off the better.

Let us, therefore, dispose of our mental junk and stale stock and start the New Year afresh. There is a selling price for cheeriness and optimism; for the brain that says "Do it," not "It can't be done;" and for the hand that does things and does not hesitate.

The best of good stock to lay in for the New Year is a confidence that there will be difficulties, and that it is a pleasure, not a misfortune, to meet them. There is all the difference between the child who crys over its problems and the manly little fellow who says, "That's some problem, but I'll bet I can solve it." After all, disappointments, difficuties, misfortune and worries change their complexions when we term them problems and view them as being both inevitable and easily solvable.

"Breasting the waves" and "facing the storm" are very different similes from "struggling against innumerable billows," and the difference is all in the point of view. The optimist is a man who can't see difficulties; the pessimist is he who sees them and whines at them or is afraid of them. The really sane man is he who sees and despises them, confident that the right attitude and the right action will meet and overthrow them.

After all, difficulty is inherent in accomplishment; censure and blame are the daily bread of the man in control of affairs; discontent and disloyalty are not new difficulties. Every man who aspires to leadership and to success must meet and face them. If he is the right man, he will take such difficulties for granted. He will forget the past and have a keen relish for the battle of the present, with an unwavering reliance on the future.

In the coming year there can be no better advice than the now somewhat hackneyed, "Turn the dark cloud inside out and smile, smile, smile." Difficulties are not the incidentals of business; they are business itself. No industry can ever be conducted without them. The only sane way is to look at their overcoming as the purpose of business, the very aim of industry. Then you will meet them with a cheerful, and not a troubled, resistance.

Most of the discontent of today and the recrimination arise from the fact that we cannot put an equal heroism into the smaller affairs of peace. A big loss, a big trouble steadies and straightens us, but a disturbance in the established order that is merely an annoyance finds our unguarded spots. In 1920 let us get back to the Olympian temper of 1918, when we had a contempt for little matters and a full assurance that we were on the way to large accomplishments.

There is in us all a sense of finality and fatality in dealing with inanimate bodies, and all the shortcomings of such things never trouble us as much as the ineptitudes of human kind. If we could only be as patient about the wrongfulness of human nature as we are about the inflictions caused by material things, there would be far less irritation and spleen in business life.

A not very wise French king who combined clock making and statecraft wisely remarked that if he could not make his clocks keep time he could not expect to make his people keep straight. He had a keen sense that human nature rebels more readily against a human foible than against a physical phenomenon. But mere protest and denuniciation will not help. What is needed is constructive thought and circumventive action unhampered by worry.

Possibilities of the Geophone in Locating Mine Fire Areas*

Many of the Inventions Brought About as a Direct Result of the War are Assuming Important Places in the Arts of Peace. Among These Is the Geophone, a Sensitive Mechanism Developed by French Sappers, and Now Used to Advantage in Locating Mine Fires

By L. D. Tracy† and Allan Leighton‡

ONE of the greatest dangers to which the coal mining industry is subjected is the occurrence of fires on the inside of mines. Often not only property, but life itself, is endangered and at such times a rapid location of the limits of the fire area is imperative, if no fatalities are to ensue.

In the past, the only means of definitely ascertaining this area has been by an exploration of the supposed danger zone by men trained in the use of oxygen breathing apparatus which enables them to withstand the deadly gases formed by the combustion of the coal. In mines generating a quantity of explosive gas, commonly known as methane or "fire damp", this is an exceedingly dangerous undertaking. Moreover, the intense heat from the burning coal often prevents a near approach to the fire. If some means could be devised by which the location of a fire area could be traced on the surface, it would be of inestimable value in mine recovery work.

During the late war quite a simple instrument, known as the geophone, was developed by French scientists for the purpose of detecting the sapping and mining operations of the Germans. Since the War, the sensitiveness of the original model has been improved by American engineers.

This instrument, briefly, is somewhat similar to a physician's stethoscope, and has been amply described in the technical press. The principal advantage over other listening devices lies in the absence of any electric battery, together with its extreme sensitiveness to sound waves.

Since the cessation of hostilities, the engineers connected with the United States Bureau of Mines have been carrying on a system of investigations to determine the practicability of the geophone for use in determining the location of any men who might be entombed in a mine through a fall of rock, or by deadly gases produced in an explosion. During the course of these investigations, there has been developed the possibility of definitely locating, with the geophone, a fire area in a burning coal mine, and thus enable the planning of a systematic method for extinguishing the fire.

Several tests have been made at mines in which fires have been known to have been burning, the object of which was to ascertain the nature of the sounds caused by the fire and which were transmitted through the intervening strata to the geophone; also to identify, if possible, these sounds with the phenomena causing them, In all cases so far tested, these sounds at the different mine fires have been identical.

In connection with the practical use of the geophone in the accurate location of mine fires, one of the most important adjuncts is a blueprint or other plan, which accurately shows the more important surface landmarks such as houses, township roads, steam and electric roads, etc. in their proper relation to the underground workings. This may readily be seen from the fact, that no matter how definite a surface location of the fire area may be made by the geophone, it is useless unless the corresponding location underground can be identified.

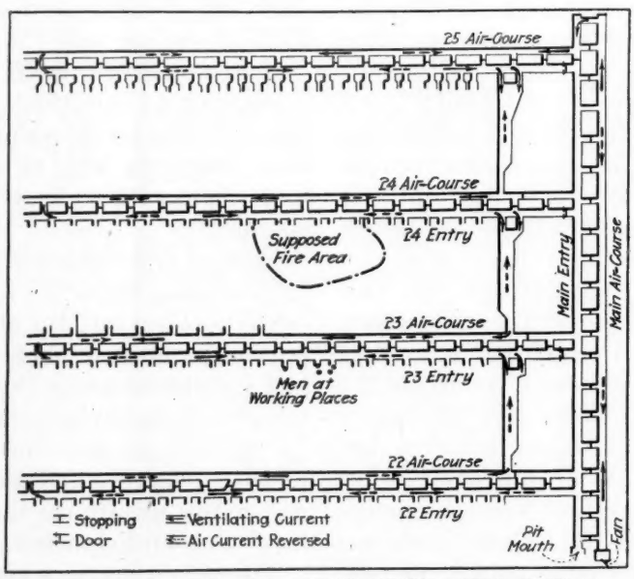

FIG. 1. DIAGRAM OF A MINE VENTILATING SYSTEM

It is also advisable to have a general knowledge of the surface elevations because any attempt to use the geophone beyond certain limits in the thickness of the cover would prove futile. These limits have not yet been ascertained, but it is hoped that they will be defined by further experimentation.

It is possible that in case the cover is too heavy, a location may be determined by using the geophone in the interior of the mine. The main obstacle to inside listening lies in the fact that the smoke and gas from the fire would probably prevent a near enough approach to the burning area to make an accurate location.

Fig. No. 1 illustrates in a general way the ventilating system of a typical coal mine. By observing the direction of the arrows it will be noticed that the fan is a blowing fan, which is forcing the air into the mine. On entries Nos. 23, 24, 25, are shown doors which permit passage up and down the entry, yet at the same time directing the air to the proper channels. In case a particular section of a mine is on fire, and men are known to be behind the burning area, it is essential to learn its exact location in order that the air current can be so regulated that if possible, the combustion gases may be diverted from them by a change in the air current; or if no lives are in danger, it is equally essential to obtain a knowledge of the fire area in order to control the ventilation so that a determination may be made

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as to where stoppings may be built which will effectively prevent any fresh air from reaching the flames and thereby furnish oxygen for further combustion. If this can be accomplished, and the fire area sealed off, in time the fire will be smothered for lack of air necessary to support combustion.

As an illustration, suppose a fire should originate on No. 24 entry in Fig. 1. Then by following the direction of the arrows it can readily be seen that the gases of combustion would be carried with the air and reach the men working on No. 23 entry. If for any reason, such as a fall of slate or roof, these men could not reach fresh air they would probably be overcome. If by the use of a geophone, the fire area could be quickly located and platted on a map, as shown by the broken line, the officials of the mine could readily see that by reversing the air currents, fresh air would be supplied to the men, enabling them to exist until assistance could be given them. The reversed air currents are indicated by the dotted arrows in Fig. 1, and from an inspection of the location of the fire area on the plan, the best means for sealing on the danger zone could be worked out. This is a simple case, but serves to illustrate the possibilities of the utility of the geophone in mine fires. It is in the determination of this fire area that, in the future, it is hoped the geophone will play an important part.

In three instances in which the geophone has been tested for this purpose, the results have been highly encouraging. One of these occurred at a mine in the Pittsburgh district. At this mine, the coal comes quite near to the surface in the vicinity of the power plant, and it is supposed that some years ago the heat from the boiler ashes penetrated the few feet of surface and in time ignited the coal pillars underneath. As this section of the mine had been pretty thoroughly worked out and abandoned, little attention had been paid to the fire. Recently, however, indications pointed to the fact that the fire was approaching dangerously near to one of the entries, used for the ingress and egress of the miners going to and from their working places, in the main part of the mine, and preparations were made to safeguard this entry. In this instance, while the exact site of the fire was not known, yet the knowledge of its general location was such that the work of protecting the entry could be effectively carried on. Briefly this consisted of sinking boreholes from the surface, so located that a thick mixture of clay and water could easily flow by gravity through them to the workings below and form a mud barrier between the fire and the threatened entry.

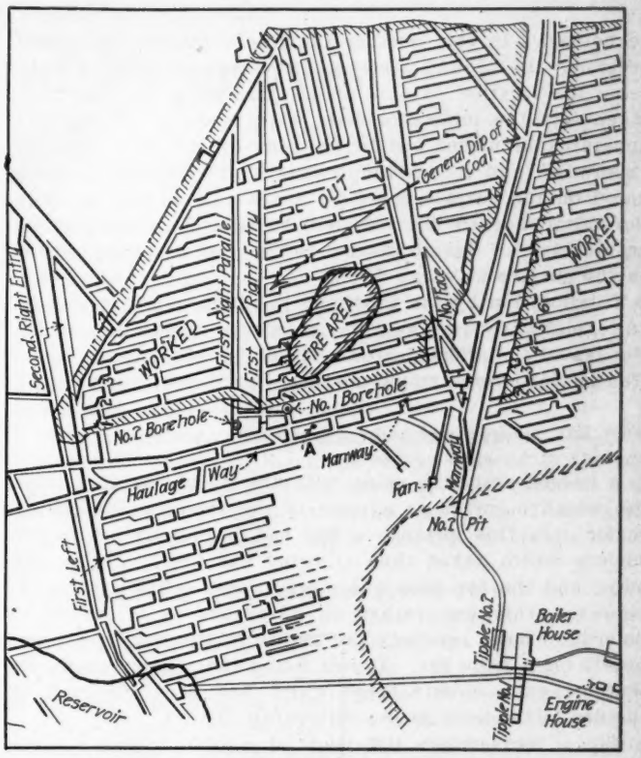


FIG. 2. FIRE AREA AS SHOWN BY GEOPHONE

During the course of the hydraulic filling operations, engineers of the Bureau of Mines decided to make a test of the geophone in order to ascertain if it would be possible to utilize this instrument in locating fire areas, and if so, to work out a practical method of operation for future use.

The geophone was placed on the surface directly over the supposed fire area. Sounds could be plainly heard through the thirty or forty feet of surface, which were described as if currents of air were being drawn through the crevices in the rocks. This might be caused by the air currents induced by the combustion of the coal. In addition, sounds of breaking and falling rock were noted, caused no doubt by the disintegration of the coal and slate under the influence of the heat. The geophone was then moved to another position where the same sounds were heard. This procedure was continued until the sounds were too faint to

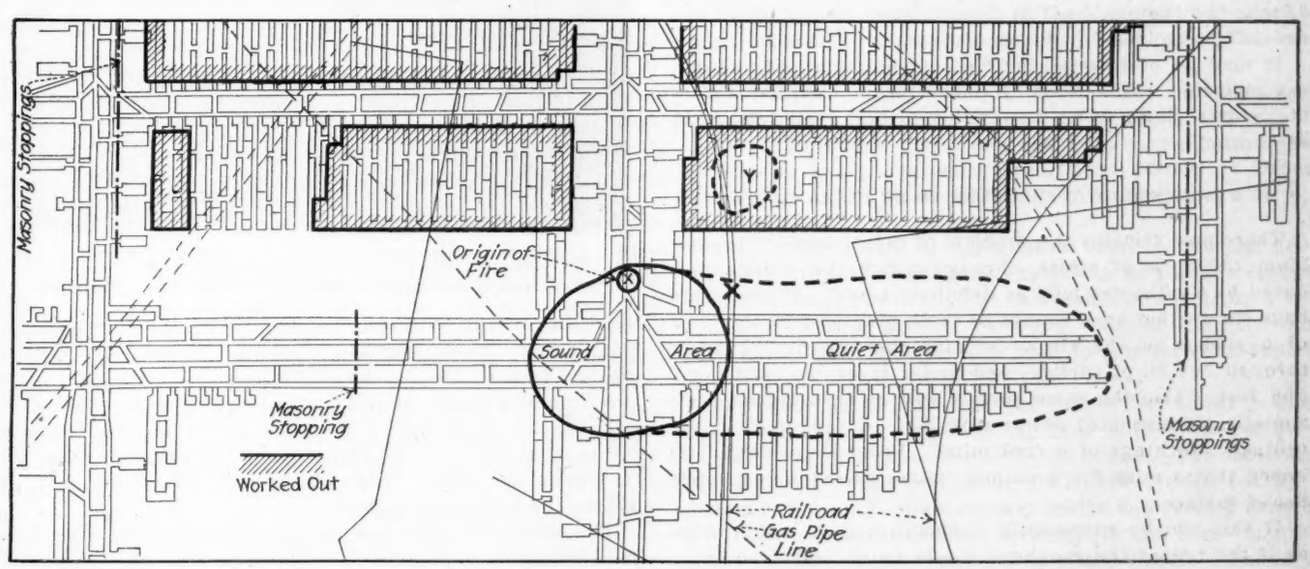


FIG. 3. DETERMINATION OF A FIRE AREA IN A MINE HAVING 300 FEET OF COVERING

be noticed. In this manner the line defining what might be called the "sound area" was determined. Fig. 2 indicates the location of this area. The geophone was then taken into the mine and tests were made by placing the apparatus in niches out in the side of the entry marked "manway", and it was found that sounds similar to those noted on the surface could be heard only at one point in the entry, marked "A". It will be seen that this point is on that part of the rib nearest to the "fire area" as located on the surface.

This location by the geophone has been substantiated by an exploring party wearing breathing apparatus, which penetrated the affected area. The fire could then be easily seen in No. 1 room stump on First Right entry.

FIRES HAVE CHARACTERISTIC SOUND

A second test was made with the geophone at a mine fire which occurred at a mine in the Connellsville coking region. In this instance a fire had been burning on the surface which caved thus allowing the fire access to the mine, and the fire area was more or less definitely known. However, this was rather an advantage as it served to determine more precisely the nature of the sounds characteristic of a mine fire. It was found that these sounds resembled quite closely those which had been observed at the fire in the mine in the Pittsburgh district.

Fig. 3 represents a test made at a mine having a cover of about three hundred feet. After the fire had started, men equipped with breathing apparatus approached near enough to locate approximately the fire area, marked the "origin of the fire." It will also be noted that a railroad track on the surface runs a short distance from this point. The distance from the point of curve of the track (marked "X") to the origin of the fire was scaled on the mine map.

Accompanied by the engineer of the coal company owning the mine, the Bureau's representatives walked down the track to the point of curve above mentioned and measured out therefrom the same distance which had previously been scaled. Placing the geophone on the ground at this point, heavy dull sounds were audible, as if pieces of rock or slate (weighing perhaps fifty pounds or more) had been dropped eight or ten feet. These sounds were traced throughout an area indicated on Fig. 3 by a heavy irregular line. The surface contained in the areas represented by the irregular broken lines was tested, but no distinct sounds were noticed. It will be seen, from an inspection of Fig. 3, that the "sound area" is directly over the origin of the fire as determined by the geophone.

It may be of interest in this connection to note that a gas pipe line was located by the geophone, and the throbbings of a pump some two miles distant were distinctly recognized.

THICKNESS OF OVERBURDEN TO BE DETERMINED

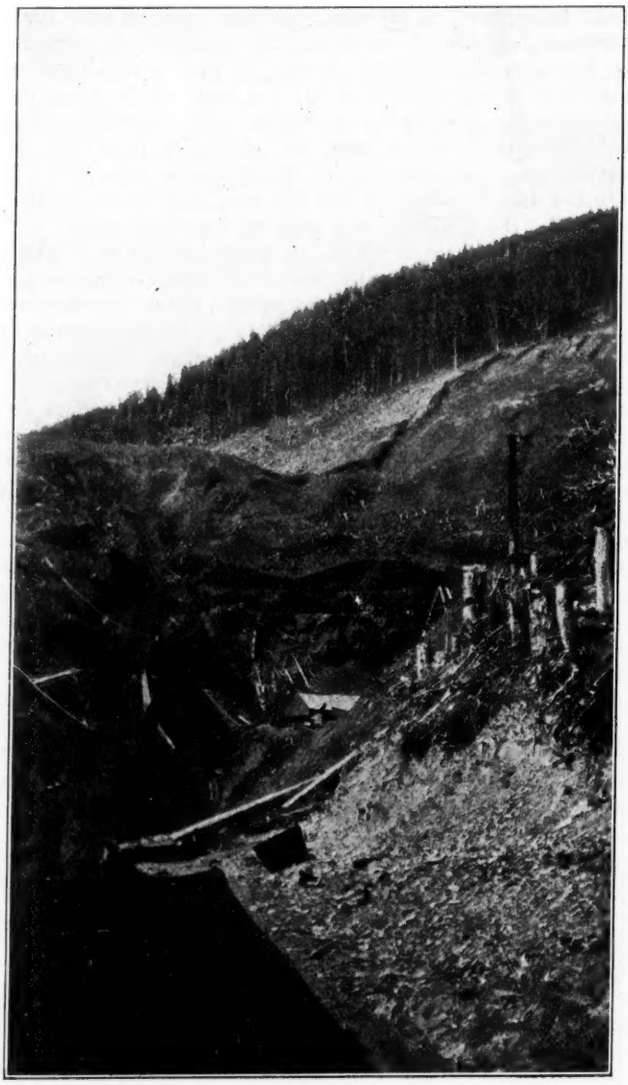
There now remains the problem of determining the maximum thickness of strata, through which the sounds produced by a mine fire may be definitely heard. Experiments have shown that such sounds as those produced by the blow of a sledge on the rib of a mine may be distinguished through 300 ft. of surface, and under favorable conditions, 500 feet. Also the same sounds will be transmitted horizontally through coal seams from 600 to 1500 feet in the ordinary workings of a coal mine. From these data it is hoped that a mine fire area may be traced through a fairly heavy surface.

If this can be successfully accomplished, it would seem as if the use of the geophone would be of great assistance in the fighting of mine fires and in the rescue of entombed men.

Only One Coal Stripping in British Columbia

This illustration shows the stripping at No. 3 mine of the Corbin Coal and Coke Co., East Kootenay District, British Columbia. It is the one instance of a strip-pit coal mine in that province though opportunities for stripping coal are doubtless numerous. The mine is locally known as the "Big Showing." The coal is stripped and loaded into dump cars, and another shovel is used to load the coal into the railroad cars.

Four separate benches are being cut and this prevents interference in the stripping and loading. The railroad in



ILLUSTRATING THE OPEN CUT AT THE No. 3 MINE OF THE CORBIN COAL AND COKE COMPANY IN BRITISH COLUMBIA

the open cut is in the form of a horse shoe, the steam shovel being on the inside and the track on the outside. Where the coal is hard, the material is blasted.

A standard-gauge railroad eight miles long runs with switchbacks up to this mine. The grade is steep despite the switchbacks, for the elevation of the stripping is 6,200 ft. above sea level. Much snow is encountered, and in winter the snowplow is busy.

The pocket of coal now being worked is 280 ft. thick. It is estimated to contain 1,000,000 tons of coal. The ratio of coal exposed to surface removed is 2 to 1 instead of 1 to 10 as is the case in some Kansas strippings.

Ignition Tests of Explosives

By W. J. Montgomery*
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Because several disastrous explosions of black powder and other explosives have been attributed to ignition from open flame lamps or to the container completing an electric circuit, the series of experiments here described was undertaken in order to determine the possibility of an explosive being ignited by either of these means. The results secured substantiate the belief that powder or other explosive could be thus detonated.

BECAUSE OF SEVERAL accidental ignitions of black blasting powder in kegs, which were attributed to open flame lamps or to contact with electrical circuits, the following tests were carried out to determine the possibility of ignition by the above causes.

The first test was that of ignition by open flame lamps. This was conducted in order to determine the possibility of igniting black blasting powder contained within kegs by the naked flame of a lamp such as a mine might carry. The explosives upon which the test was made were:—1. Unglazed FFF black blasting powder pressed in rollers and packed in two 12½-lb. sausage-like double thickness paper cartridges, which were in turn packed in long 25-lb. sheet-iron kegs with slip-on tops. The powder and container were those employed in the anthracite fields of Pennsylvania. The samples used were denominated as B—2549, A, B, etc.

The next sample was FFF black blasting powder (glazed) packed in bulk 25-lb. to the keg. The kegs were of the common or short type as used in most sections of the country and the samples tested were denominated B—2571, A, B, etc. The serial numbers are shown in Tables 1 and 2.

Each keg was denominated by letter. Thus, B—2549—A and B—2549—B indicates two separate kegs of the same powder.

For purposes of comparison, two permissible explosives and one sample of dynamite were also ignited. These were: One—A permissible explosive of class 1-a. This was denominated D—2538—A. Two—A permissible explosive of class 4. This was denominated B—2403—A. Three—A sample of 40 per cent. straight nitroglycerin dynamite. This was denominated B—2335. All of these high explosives were packed in 1¼ × 8-in. cartridges. The keg numbers, as indicated above, are used throughout this article.

The apparatus employed was as follows: For the lamp ignition test a keg rack was constructed. To a 12-in. base board two side boards 18-in. long were nailed. The lamps were placed on a board or "carriage" which slid between guides on the base board so that the flange could be pulled under the keg from a safe distance. Two sheet-iron wind shields were placed, one on the base board and one on the carriage so that when the lamp was in place it was only slightly affected by the gentle breeze which prevailed during some of the tests. The keg was placed across the two side boards and secured with wedges in a position with its axis normal to the axis of the rack. The flame was applied to the center (lengthwise) of the keg.

In the comparative tests with permissibles and dynamite the same rack was employed. It was, however, lined with sheet iron so as to prevent too rapid combustion of the wood. Four cartridges of the explosive were wired around a ⅜-in. copper rod which was placed across the rack as in the case of the keg.

In all cases, the distance from the top of this wick to the powder keg or explosive was ¾-in.

Two kinds of lamps were employed burning two different fuels: One—An open flame driver's lamp. This lamp was 3 5/16 in. high from the base to the top of the spout, the effective inside diameter of the spout used being 1/16 in. Two—An open flame miner's lamp. This lamp was 2¾ in. high from the base to the top of the spout, while the effective inside diameter of the spout was 1/32 in. In both lamps the spout was double-walled.

The lamps were wicked with medium wicking and when "sunshine" was used, the brass rod was placed in the center of the wick. In all cases, the lamp was burned at least 30 min. at some time prior to the test. Fig. 1 shows the keg rack, types of kegs, lamps and typical results of explosion.

In conducting these tests, the procedure was as follows: The explosive was first placed in the rack. All kegs of B—2549 were placed so that a part of the cartridge was in contact with the keg at the point heated. Where two or more trials were made on the same keg, an unscorched part of the cartridge was placed in contact with the keg where heat was applied in each instance. The lamp was then lighted. The observers retired to a safe distance and the lamp was pulled under the keg and the time noted. The results were also noted as they transpired.

The results of the tests are shown in tabular form in Table 1.

There was a marked difference between the concussion arising from the explosion of B—2571 and B—2549, in all cases that of the former being more violent. This was to be expected as the powder was in bulk, so that the flame could travel more rapidly. The confinement was also greater, as in B—2549, the cover was held on only for friction.

The products of combustion of the black powder attacked paint vigorously even at a distance of 40 ft. This was probably due to the hot sodium carbonate.

Photographs were made at the moment of ignition of several tests. These are shown in Figs. 2, 3, and 4. All of the experiments here described were carried out at the Bureau of Mines Explosive Experiment Station at Bruceton, Penn. They were conducted by A. B. Coates and myself.

The second series of experiments were conducted upon the possibility of ignition of explosives by electric energy, the object being to determine the possibility of firing a keg of black blasting powder when the walls of the keg complete an electric circuit. The tests in this series of experiments were carried out on B—2571.

The apparatus in this case consisted of two empty powder kegs of the short type tied together with twine while a common stranded cable was soldered to each. The cable was then connected to one side of a 220-volt circuit fed by a 250-volt, 210-amp. direct-current motor run from a generator. Two more kegs were prepared in the same manner and connected to the opposite side of the circuit. The kegs were then placed horizontally in a frame which held the

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TABLE I

RESULTS OF IGNITION TESTS ON BLACK BLASTING POWDER IN KEGS, USING OPEN FLAME LAMPS

	METHOD								RESULTS				
Test	Explosion	Date Sept. '19	Lamp	Fuel*	Flame of Lamp Inches	Position of Keg	TIME Hrs. Min. Sec. A. M.	Min. Sec.	Action	Flame of Explosion Observed	Keg	Rack	Lamp	Remarks
M1565	B-2571 Short keg.	22	Miners	S	3½	Crimp down 2 in. from flame.	10:50 :51 :52	0- 0 1: 2:	Flame applied. Blue smoke.† Ignition, slight concussion.	Ball 6 ft. diameter, 20 ft. high rolled up in air. Lasted 4 sec.	Open flat as if developed top attached; bottom blown off. Keg thrown 9 ft.; bottom thrown 12 ft. See Fig. 1.	Both sideboards and both windshields blown off. Sides thrown 12 ft. and 18 ft., windshields thrown 40 ft. and 45 ft. Rack scorched.	Put out, uninjured. Thrown 15 ft.	Flame not round, while it appeared only 6 ft. in diameter to observer, yet flame came through hole in gallery 17 ft. on side away from observer. Dead limb 30 ft. above keg set on fire. Products of combustion fell for several seconds.
1566	B-2571A Short keg.	22	Miners	0	2½	Crimp up.	11:46:30 47:30 50:30	0: 0 1: 0 4: 0	Flame applied. Blue smoke.† Ignition; concussion followed by hissing sound.	Ball 20 ft. diameter rolled up 50 ft. Lasted 3 sec.	Opened and folded; both ends blown off. Side thrown 17 ft., top thrown 31 ft. and bottom thrown 36 ft.	One sideboard and one windshield blown off. Side thrown 13 ft., windshield thrown 11 ft. Rack scorched.	Extinguished. Thrown 15 ft. Uninjured.	2 wisps of guncotton 10 ft. away ignited. 2 wisps of guncotton 15 ft. away, 1 ignited and 1 did not. Limb 30 ft. above keg re-ignited. Products of comb. fell for several sec. 2 gms (app.) unburned powder fused to bottom of keg.
1572	B-2549 Long keg.	23	Miners	0	3 Wick too tight, whenwithdrawn flame 1 in.	Crimp up.	(P.M.) 10:04:10 11:15	0: 0 70:50	Flame applied. Flame withdrawn. No ignition.	None.	Soot ½ in. deep. (max.) deposited where flame applied.			Paper, etc. charred through. Powder in cartridge at point when flame was applied, fused into compact mass.
1573	B2549 Long keg.	24	Drivers	S	3½	Crimp down. 2 in. from flame.	A. M. 9:38:20 39:20 10:08:00	0: 0 1: 0 29:40	Flame applied. Blue smoke.† Withdrawn; no ignition					Same kegs as test M-1572. Scorched ctg. covered. Paper ctg. scorched through. Powder fused solid for 4 in.
1574	B-2549 Long keg.	28	2 Drivers placed spout to spout.	S	6	Crimp half down 5 in. from flame.	9:24 9:31	0 7	Flame applied. Ignition. Slight concussion followed by hissing sound.	20 ft. diameter rolled 30 ft. in air. Ctg. seen burning in air; duration 5 sec.	Burst at crimp; held at both ends thrown 3 ft. top thrown 15 ft.	Scorched. Uninjured.	Uninjured. Extinguished. Carriage pushed out of rack.	Same keg as Test M-1572; scorched ctg. covered. H S odor noticed. Burning ctg thrown 5 ft.
M1575	B-2549-B Long keg.	28	2 Drivers placed spout to spout.	S	6	Crimp up.	10:11 12 13 14 17	0 1 2 3 6	Flame applied. Blue smoke.† Clicking.‡ Clicking.‡ Ignition; slight concussion, second conc, hiss -like big skyrocket.	20 ft. diameter rolled 20 ft. in air. Burning cartridge dropped from keg in its flight for 9 ft.	Keg thrown 52 ft. uphill like shyrocket. Bottom blown loose 1 place. Some paint scraped off keg. Lid thrown 6 ft.	Scorched. Uninjured.	Uninjured. Extinguished. Thrown out of rack.	Grass burnt off for ? ft. along path of keg. No H S noticed.
1577	B-2571-D Short keg.	29	Drivers	S	5		P. M. 5:10:30 12:20	0 1:50	Flame applied. Ignition.	See Fig. II.		1 Side Board blown off. See Fig. I.		Demonstration for dedication exercises. Flame, etc. about as per M-1565-6. Nothing unusual noticed.
1578	B-2571-E Short keg.	29	Drivers	S	4		5:10:40 15:00	0 4:20	Flame applied. Ignition.	See Fig. III.				Run at same time and for same purpose as M-1577. See M-1577.
1579	B-2549-C Long keg.	29	2 Drivers spout to spout.	S	6		5:21 25	0 4	Flame applied. Ignition.	See Fig. IV.	Opened along crimp. See Fig. I.	Rack ignited. Platform on which rack rested also ignited.		See M-1577.
1580	B-2549-D Long keg.	29	2 Drivers spout to spout.	S	4		5:21	0	Flame applied. Ignition; slight concussion hissing sound.	15 ft. diameter 35 ft. high.	Opened at crimp.	Rack and platform ignited.		See M-1577.

TABLE I—Continued.

1569	D-2538-A	23	Miners	0	3	9: 9:30	0	Flame applied.		Explosive burned quietly. Few Products of comb. No explosion.
						9:40	:10	Smoke.		
						:50	:20	Exp. burning	6 to 8 in. high some sparks.	
						11:10	1:40	Burning briskly.	18 in.	
						:50	2:20	Burning briskly.	3 ft.	
						12:15	2:45	Ctg. fell off rod.	3 ft.	
						13:00	3:30		1 ft.	
						13:50	4:20	Exp. out.	On fire.	
M1570	D-2403-A	23	Miners	0	3	9:23:00	0	Flame applied.	Wood burning under sheet iron.	Explosive burned vigorously; bulky products of comb. No explosion.
						:20	:20	Smoke.		
						:30	:30	Exp. burning		
						:40	:40	Exp. burning briskly	4 ft.	
						24:00	1:00	Exp. burning briskly	6 ft.	
						:20	1:20	Exp. burning briskly	2 ft.	
						:30	1:30	Exp. burning briskly	1 ft.	
						:50	1:50	Exp. burnt out.	On fire.	
1571	D-2335	23	Miners	0	3	9:35:00	0	Flame applied.	Wood burning under sheet iron.	Explosive burned vigorously. Products of comb. molten. No explosion.
						:10	:10	Smoke.		
						:15	:15	Ignited.		
						:25	:25		Bright.	
						:40	:40	Burnt briskly.	4 ft.	
						:50	:50	Burnt briskly.	6 ft.	
						36:00	1:00	Burnt briskly.	3 ft.	
						:35	1:35	Exp. out.	On fire.	

†Sunshine.
†As of paint burning.
$Probably due to heating of keg.
$Miners lamp oil.

TABLE II

RESULT OF IGNITION TESTS ON BLACK BLASTING POWDER IN KEG, USING ELECTRICAL ENERGY

Test	Keg	Date		Circuit Breaker	Circuit Breaker	Volt Meter	Ammeter	RESULTS Keg
M 1567	Empty.	Sept. '19 23	Keg Rolling. Circuit Closed.	No. 1 Set at approx. 60A—opened.	No. 2 Set at approx. 60A—opened.	Volts 220–230	Amperes Circuit opened too soon to read.	No effect.
1567	Empty.	23	Keg Rolling. Circust Closed.	Set at approx. 60A. Opened almost instantly.	Remained closed.	220	60	Shower of sparks visible. ¼ in. hole fused through keg tested. ⅜ in hole fused in one of the bottom kegs.
1567	B-2571-B Short keg.	23	Keg Rolling. Circuit Closed.	Set at approx. 60A. Opened almost instantly.	Set at approx. 60A; remained closed.			Sparks spit out at point of contact. Heat caused paint on B-2571-B to stick to bottom kegs. No ignition.
1567	B-2571-B Short keg.	23	Keg Rolling. Circuit Closed.	Set approx. 60A. Opened almost instantly.	As above.			Ignition; almost coincident with closing of switch. Flame and concussion about as usual. Max. dist. parts thrown, 44 ft. (keg). No holes fused in kegs.
1576	B-2571-C Short keg.	29	Keg Rolling Circuit Closed.	Set 160A opened almost instantly.	Set 600A remained closed.			Demonstration for dedication exercises. Some paint cleaned off kegs at point of contact to be certain of ignition. See Fig. VI. Ignition—almost coincident with closing of switch. ¼ in. hole fused in wall of keg. Flame and concussion as usual.

FIG. 1. APPARATUS FOR IGNITION OF BLACK BLASTING POWDER IN 25-POUND KEGS BY OPEN FLAME LAMPS AND RESULTS OF TWO IGNITIONS.

adjacent kegs of opposite polarity 1 in. apart. The frame was so arranged that the keg to be tested could be placed on top of the other kegs thus bridging the circuit. The keg tested was fitted with a rocker arm which permitted its being rolled back and forth on the electrically charged kegs.

The instruments in the line were as follows: In the engine room, one volt meter, an ammeter, a No. 2 circuit breaker and a No. 2 line switch, at the testing ground there were installed a circuit breaker No. 1 and a No. 1 line switch.

Fig. 5 shows the empty powder kegs, frame and switchboard at the testing ground before test M—1576. The keg of powder B—3571—C is not in place.

The procedure pursued in connecting these tests was as follows: The circuit breaker No. 2, line switch No. 2 and circuit breaker No. 1 were closed. A keg was placed in the rack. It was then rolled back and forth over the empty kegs and while being thus moved, the empty kegs were thrown on the line by means of line switch No. 1. The results of this procedure were then noted.

The results of these tests are shown in table 2, and a photograph taken at the moment of ignition during test M—1576 shows the detonation of a 25-lb. short keg of FFF black blasting powder while bridging a 220-volt circuit. During these series of tests, E. J. Gleim, of the electrical section, coöperated with Mr. Coates and the writer.

The conclusions to be drawn from this series of experiments are as follows:

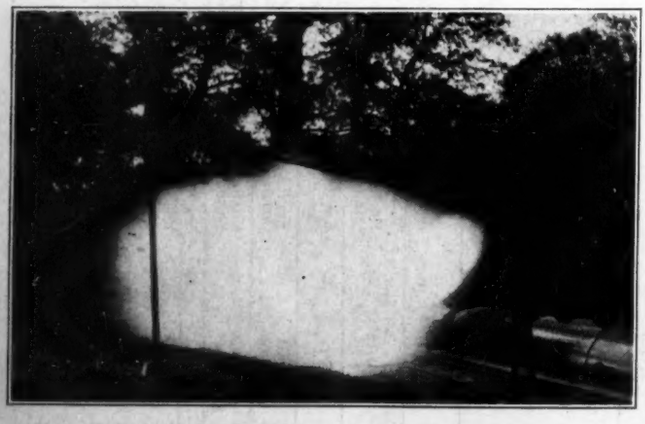


FIG. 2. 25-POUND KEG OF FFF BLACK BLASTING POWDER (B-2571-D) AT MOMENT OF IGNITION BY OPEN FLAME DRIVER'S LAMP. (TEST M-1577)

1. That black blasting powder of the type tested can be ignited in kegs by open flame lamps.

2. That a keg of black blasting powder can be ignited through the completion of an electric circuit passing through the walls of the keg even though several containers of the same kind are in the circuit, providing an arc is drawn.

3. That open flame lamps should not be used near black blasting powder even if in unopened kegs.

4. That since the current required to ignite a keg of black blasting powder seemed to be less than 160 amp., and is certainly less than 210 amp., and since a single mine motor with a full trip will draw a current of this order of magnitude, all practicable precautions should be taken to keep kegs of black blasting powder away from electrical circuits at all times.

5. When hauled in a motor trip, black blasting powder should always be inclosed in nonconductive receptacles. Dry wood, blind nails, or fiber, are appropriate nonconductive materials.

6. Black blasting powder should not be placed nearer than 5 ft. to an electrical circuit.

7. Excellent recommendations, laws or rules covering the subject discussed in this article are as follows:

(A.) From the mining laws of West Virginia, 1915, Sec. 80, p. 48:—"Where permissible explosives are used, the detonators and explosives shall be kept separate; no

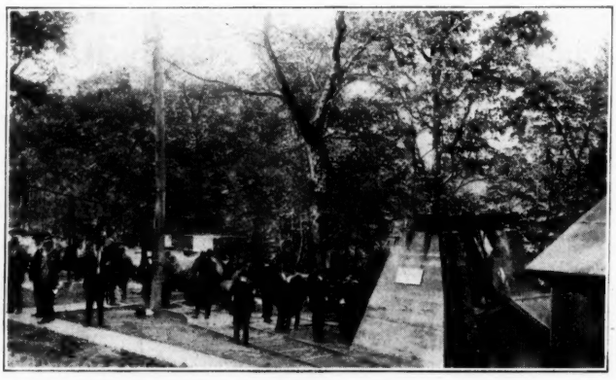


FIG. 5. VIEW OF EXPLOSIVES EXPERIMENT STATION DURING DEDICATORY EXERCISES. APPARATUS FOR ELECTRICAL IGNITION TESTS SHOWN IN LEFT BACKGROUND

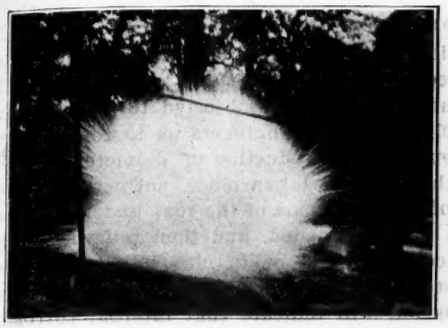
black powder, high explosives or detonators shall be hauled on any trip operated by electric haulage motors unless inclosed in nonconducting boxes approved by the district inspector."

(B.) From the Industrial Accident Commission of California Mine Safety Rules, 1916, Sec. 45 p. 63:—"Explosives shall not be placed or left within 5 ft. of live electric wires."

(C.) Recommendations to the Governor of Pennsylvania by the coroner's jury investigating the disaster in the Baltimore tunnel No. 2, Wilkes-Barre, Penn., Coal Mine Fatalities, June, 1919, p. 16. "That, in order to minimize danger from blasting powders and explosives carried in the workings in the mines, all powder or explosives shall be transported in separate and distinct trains; that in no case shall it be permitted that men ride in the same cars or in the same trains with said powder or explosives.

Where electric motive power is used, the powder should be encased in containers of nonconducting and noncombustible material and that the only persons permitted to accompany said powder or explosives on cars or trains supplied with such motive power shall be the persons necessary to man the mechanism employed."

(D.) From the Department of Labor, State of Michigan, Act Regulating the Operation of Coal Mines, 1913,



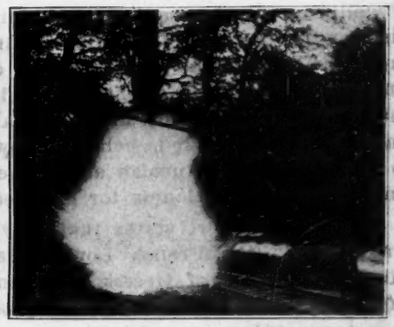


FIG. 3. 25-POUND KEG OF FFF BLACK BLASTING POWDER (B-2571-E) AT MOMENT OF IGNITION BY OPEN FLAME DRIVER'S LAMP. (TEST M-1578). FIG. 4. 25-POUND KEG OF BLACK POWDER AT MOMENT OF IGNITION FROM TWO OPEN FLAME DRIVER'S LAMPS (TEST M-1578). FIG. 6. 25-POUND KEG OF FFF POWDER (B-2571-C) AT THE MOMENT OF IGNITION BY BRIDGING A 220-V. CIRCUIT WITH THE WALLS OF THE KEG.

Sec. 34, p. 11:—"blasting powder or explosives must not be taken into or out of a coal mine or moved from place to place in a coal mine along any entry or haulway where there are electric wires while the power is on such wires, except when such powder or explosives is conveyed in insulated cars or packages."

8. That in the haulage and handling of black blasting powder, open flame lamps should be kept at a distance of not less than 5 ft.

9. That the danger zone from the ignition of a 25-lb. keg of black blasting powder in the open is at least 50 ft. and greater than 50 ft. in restricted areas.

Use of Grease in Lubricating Mine Cars

It has long been recognized by mine managers that one of the most wasteful practices around the coal mines is that of oiling mine cars with what is commonly known as black oil. This is a cheap residue with small lubricating value. Due to its lack of lubricating quality it is necessary to lubricate mine cars every day. This requires a greaser, who is ordinarily a careless, incompetent boy. He draws the black oil from a tank into a powder can and carries it to the point where the cars are to be greased. His path is usually well marked by puddles of wasted oil.

After he has his supply ready to use he employes a gun made of a piece of pipe. This gun holds possibly a pint of oil. Boy fashion, he takes delight in squirting the oil on passers-by or on the side of the car, while some of the oil gets in the wheels. He does not seem to care whether or not the wheels are already full of lubricant, but seems to feel that he must put a gun full of oil into every wheel regardless of whether or not it is required. Any person who has seen the empty tracks in mines where greasing is carried on (where ordinary all the way from 1 to 2 in. of oil may be found all over the floor) can realize the great waste of material and money arising from this method of attempting to lubricate mine cars.

Lubricating men in general have realized for some time that a light grease would be the proper lubricant for mine cars, and in many instances cars have been used with such a grease. In many cases the lubricant company has furnished to the coal company a grease gun which generally is operated by a crank or plunger but which is much harder to operate than the old fashioned oil gun. Because of this hard operation such grease guns always seem to get out of order in a short time. Quite frequently they are run over by a trip of cars or a locomotive. Whether or not this is done intentionally is hard to say. In any event scarcely any of the coal operators have continued to use grease because of difficulty in putting it into the mine car wheels.

With the idea in mind of making this operation easy entailing little labor and no waste of material, the Newton grease gun was developed. With this system which can always be used advantageously it is only necessary for the greaser to push the gun into the hole in the wheel cap. He has no grease or oil to carry, no valve to turn and, in fact, it is almost impossible for him to waste any material.

Another advantage of this system is that by using a light grease it is necessary to lubricate the cars only about once every 60 days thus dispensing entirely with the employment of the greaser boy. In the case of the Sunday Creek Coal Co. two competent men were put on one day in every 60 which, of course, is quite a saving over the constant service of a greaser boy. The savings in using light grease worked out as follows, at mine No. 2, Sunday Creek Coal Co., with 210 mine cars, capacity 700 tons per day, black oil at 15½c per gal. and grease at 9c per lb:—

When using black oil this mine has consumed an average of 8 barrels per month. Using light grease it now requires one barrel of 300 lb. per month.

8 bbl. of 50 gal. each @ 15½c per gal.....$62 per month
300 lb. grease @ 9c per lb. .....$27 per month
showing a saving of $35 per month on material.

Labor, using black oil, requires a grease boy at $3.24 per day working 20 days per month which would be $64.80; using grease requires 2 men but once every two months at $5 each, which would be $10 for each two months, or $5 per month. Thus the saving on labor is $59.80 per month. This plus the saving on material of $35 makes a total saving of $94.80 per month.

In addition to this saving there will be with the grease no burned out mine car wheels which are common when using black oil. With mine car wheels costing about $6 each this becomes quite an item in a year's time.

Almost any light grease can be used in this gun. In fact it is also well adapted to use with black oil as it does away with much waste, but the real savings come from using a higher grade of lubricant.

Coal Deposits on the Amaga Railway in Columbia, South America

The Amaga Ry. passes through extensive coal beds, which are found on the western watershed after passing "La Quiebra." In several places the railway cuts pass through three horizontal strata of coal. Locomotives can thus be fired at the tracks. In the valley one coal property alone is said to contain 5,000,000 tons of coal. It is bituminous in character, quite light and highly volatile; from 45 to 60 per cent. volatile matter. The cost, delivered in Medellin, cartage from railway station paid, is $4 per ton. The cost to the railway at the coal beds does not exceed $0.65 per ton mined and sacked on flat cars. Although this coal will not coke, such a grade can be found just north of

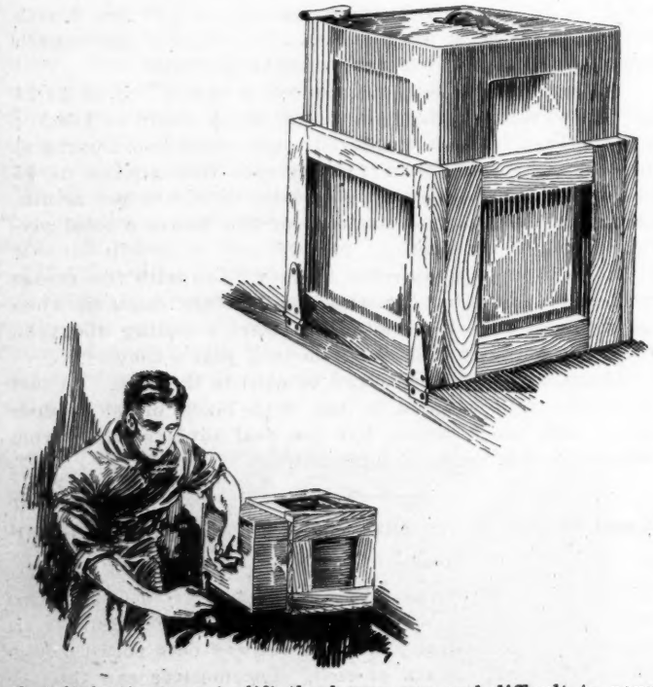
Medellin on the Antioquia Ry. Mining operations are carried on in the most primitive manner, the mines being mere one-man incline shafts and the coal being carried out on men's backs. No scientific examination has ever been made of these coal beds, and no data as to their extent or value is available. It is believed, however, that the supply is large enough to furnish all the needs of transportation and industry in Antioquia for hundreds of years

A consular report states that only one coke-oven plant was seen in the French Lorraine area, namely, at the Moyeuvres works of Messrs. De Wendel, where there are 105 Koppers' ovens installed, for producing coke for their own needs. Here is used in the ovens about 75 per cent. of Saar coal (from their Petit Rosselle mine in Lorraine, a continuation of the Saar coal field), and about 25 per cent. of Westphalian coal; it makes a coke which can be used in the blast furnaces at these works, but can not stand transportation, being too friable. It is generally agreed that it is necessary to add a minimum of 25 per cent. of Westphalian coal to the Saar coal, as the local product alone is not a strongly coking coal and is unsuitable for transportation. This was confirmed by observations at the steel works in the Saar Valley, where there are many coke-oven installations following the same practice, although coke was being made in one works (Neunkirchen) from Saar coal alone.

Efficient Oil Can Tipper

By CHAS. H. WILLEY
Concord, N. H.

The accompanying illustration shows a simple yet handy scheme for making a tipping rig that will enable the easy handling of a 5-gal. oil can. Anyone who has ever attempted to fill a small squirt can from a large 5-gal. container knows



that it is tiresome to lift the heavy can and difficult to pour its contents into the smaller can without overflowing or spilling.

By making a small square wooden crate and hinging one side of it to the bench top, as shown, it is possible to set the heavy can in place and while holding the small squirt can in one hand the large can can be tilted to a convenient filling angle with the other by aid of this hinged tipping rig.

Corrosion in Wire Ropes

In a circular issued to managers of mines on the Rand, S. A., it is pointed out that experience has shown that wire ropes of compound construction subjected to corrosive influences are likely to deceive engineers as to the strength remaining in them. Where reduction of diameter, or circumference, of the rope has taken place, not accounted for by the evidence of wear, the part of the rope under examination should first be fully loaded, and then relieved of the load. Any noticeable difference in circumferences under these circumstances, and the slackening of the outside wires when the load is off, will indicate that internal corrosion has taken place. The extent of corrosion inside the strand can only be estimated by the slackness of the outside wires. The corrosion between the strands can be further examined by untwisting the rope or displaying the strands sufficiently with a marline spike.

Engineers are apt to imagine that reduction in the size of a rope may be due to some collapse of the hemp core. In a test at the Mines Department mechanical laboratory of a 1.28 in. diameter rope, the hemp core was entirely removed for about 5 ft. of the length. The specimen was gradually loaded up to 30 tons, but beyond a slight increase of the lay from 10½ in. to 11 in., subsiding after test to 10¾ in., there was practically no alteration in the shape or size of the rope.

In some recent tests of corroded ropes, the following results were obtained:

Original Diameter in Inches		Breaking Load	Elongation at Test	Breaking Load at Test
Rope	Wire	lb.	Inches	lb.
1.5	0.099	222,208	1.41	191,960
1.5	0.099	222,208	1.40	166,660
1.5	0.099	222,208	1.30	137,260
1.5	0.099	222,208	1.23	66,880
1.5	0.102	220,000	1.22	97,260
1.25	0.115	148,700	1.23	137,660
1.25	0.115	148,700	1.00	78,920

In all the above-mentioned cases the outside wires were less than half worn, but the internal corrosion was excessive. The wires were brittle also. Experience has shown that the remarks concerning corrosion on the certificate of bi-annual tests are taken as merely applying to the test specimen and not considered as having a bearing on the state of the rest of the rope.

Labor Disputes in South Wales

Our Sydney correspondent writes, under date September 30: When the coal miners practically secured all the demands peremptorily insisted upon by the unions, it was understood that the Government made the concessions on the condition that industrial peace was to prevail, but since the increases of wages and betterment of working conditions have been granted, there have been at least 30 stoppages; and, further than that, the Australasian Coal and Shale Employees' Federation, which promised the Acting Prime Minister that no application for altered conditions in the industry would be made until the end of 1920, is now formulating a demand for altered hours. Although the Newcastle coal fields are almost worked out, there is practically an unlimited field around Maitland. It is estimated that there are 153 square miles of coal land in the northern field, and a total gross quantity of workable coal of 1,893,000,000 tons. Since the opening of the field at Greta in 1893, 15 collieries have been established, resulting in a dozen new towns, with a population of approximately 20,000. New collieries are being opened up in various parts of the district.

Power Factor as it Affects the Cost of Energy

By G. M. KENNEDY
Lansford, Penn.

This article attempts to explain in nontechnical terms what constitutes power factor and how the power factor of any installation affects actual power consumption. An equitable charge for electrical energy should take into account the power factor of the consumer's installation.

At the present time, there is much discussion in regard to the proper method of charging for electrical energy. Possibly, the main cause of this controversy lies in the subject of power factor. While this subject is of the utmost concern to all central stations furnishing electricity for power, for whatever use as well as to the consumers who are buying the energy, this article is intended, primarily, to apply to central station power purchased for coal mine service, although it's scope extends to all electrical industries.

A few years ago, it was customary for each and every coal company to operate it's own power station or stations, and these companies were not concerned about purchasing power, neither did they, as a general rule, have data or at least, accurate data as to the cost of the power supplied from their own stations. This was because the central boiler room furnished steam not only to the power stations, but also, to steam-driven hoists, fans, pumps and other machines, and if a division of the boiler room costs was made it was a nominal rather than an accurate one. Another reason for the lack of accurate figures on the cost of this power arose from the fact that the use of watthour meters for measuring the power drawn from the station was the exception rather than the rule. It is obvious therefore, that data on the costs of power were almost necessarily assumed.

Of course, in those days the large-capacity central station was out of the question, because of the prohibitive cost of the generating units. These were comparatively small for they were of the reciprocating type, and the large steam turbine had not then been developed. However, with the introduction of the steam turbine, as it exists today there commenced a new era in the electrical industry. This machine created a field in electricity which previously, did not exist and, at the same time, made possible the large central station. This was due to the comparatively low cost of the large-capacity turbo-generator as contrasted with the small capacity of the old reciprocating-engine type of unit.

Many of these small coal-mine power stations are in service today and considerable numbers are still being installed, but nevertheless, the large central stations will furnish the power to coal mines and other industries in the future. This change is coming rapidly and with it there are new problems arising which will demand solution.

One of the most important of these questions, if not the most important of them, is the proper method of charging for power consumed. As indicated above the chief problem involved in the cost of this energy lies in the power factor.

Those, in the coal-mine industry, who are purchasing their power hear so much of this question of power factor and in many instances know so little about it, that it might be well to describe in a comparatively simple way what power factor really is.

Many of the old mine power stations were of the direct current type, while the large central station generates three phase alternating current. There are reasons for this, but they are not essential for the purpose of this article.

In forcing direct current through a circuit, resistance to the flow is the only important consideration, while in alternating current there are three items to contend with, viz; resistance, capacity and inductance, the two latter being known as reactance. Of course, whether direct or alternating current is used, the circuits and equipment require attention, but for the sake of this discussion, this can be neglected.

The power measured in watts in a three phase circuit is equal to the product of the square root of three, times the electromotive force in volts, times the current in amperes, times the power factor.

In direct current, the electromotive or driving force and the current (the amount flowing) work together—arm in arm, so to speak. With alternating current, if there is no reactance, or, if there is sufficient capacity reactance to offset the inductive reactance, the current and electromotive force will behave exactly as in the case of direct current, that is the two will operate together. In practice, however, it is impossible excepting perhaps, in extremely rare instances to attain this condition.

The result of capacity reactance is to cause the current to lead or precede the electromotive force in phase, while the result of inductive reactance is to cause the current to lag behind the electromotive force in phase.

From the angle between the current and the electromotive force, whether the current is leading or lagging is where power factor is determined. The cosine of this angle of displacement between the electromotive force and the current is termed power factor.

This angle varies with the amount of current flowing and consequently, the power factor varies, because the cosine of the angle changes with the angle itself.

When a condition exists similar to that encountered with direct current, that is when the electromotive force and current keep together, so to speak, the angle between them is zero, and the cosine of an angle of zero degrees is unity, or, 1. The power factor, therefore would also be unity.

When the power factor is unity it is termed a 100 per cent power factor. If the cosine of the angle of displacement is .8 the power factor would be termed 80 per cent, if the cosine is .74, the power factor would be termed 74 per cent and so on.

The question now arises as to how power factor enters into the cost of electrical energy. To explain this point, it is necessary to know that all electrical equipment, whether it be an alternator, transformer, motor or what not, is rated as to capacity according to the heating of that particular machine, and it is the current flowing which causes the heating—the amount of heat varying with the square of the current flowing.

As stated above, the power in watts in a three phase alternating current circuit is equal to the product of $\sqrt{3}$ times the volts, times the amperes times the power factor.

This is usually written $P = \sqrt{3}\ E\ I \cos \theta$.

Where P equals the power in watts, $\sqrt{3}$ equals 1.73, E equals the electromotive force in volts, I equals current in amperes, and Cos θ equals the power factor.

In all present systems, power is purchased at a fixed voltage, so that practically the only varying quantities at the central station are the current in amperes and the power factor. For a given amount of power required by a consumer, if the power factor is of low percentage the current will be high and if the power factor is 100 per cent or nearly so the current will be low.

As an example of this principle, it can be assumed that a customer requires 1500 kilowatts (one kilowatt equals a 1000 watts), that the electromotive force is 11,000 volts, and the power factor 90 per cent.

By using the formula given above,

$$P = \sqrt{3}\ E\ I \cos \theta$$

we have, $1{,}500{,}000 = 1.73 \times 11{,}000 \times I \times .9$ or $I = \frac{1500000}{.9 \times 1.73 \times 11000}$

Thus $I = 87.5$ amperes.

Now, if the power factor were 70 per cent instead of 90 per cent, the other conditions remaining the same the current would be:

$$1{,}500{,}000 = 1.73 \times 11{,}000 \times I \times .7$$

$$\text{or } I = \frac{1500000}{.7 \times 1.73 \times 11000}$$

or in this case, $I = 112.6$ amperes

Remembering as stated above, that generators are rated according to their heating, and that this heating varies with the square of the current flowing, it is readily seen that the central station would acquire a much larger unit for the 1500 kilowatts at 70 per cent power factor than would be necessary if the power factor was 90 per cent. The copper in the transmission line would also be larger and heavier in the case of the 70 per cent power factor than would be required in the case of the 90 per cent power factor.

ANOTHER SCHEME OF DETERMINATION

Another way of demonstrating the same principle is as follows: If a central station had a unit of 12,000 kw. (or kilovoltamperes) capacity at unity or 100 per cent power factor, this same unit a 70 per cent power factor would only have a capacity of .7 of 12,000 or 8400 kilowatts. That is to say, full load current the equivalent of 12,000 kw. and unity power factor would be flowing through the unit at 8400 kw. and 70 per cent power factor.

With the above explanations, it is apparent that the customer who has an average power factor of 80 per cent should pay less per kilowatthour for his power than the customer should pay who has an average factor of 70 per cent.

This leads to the hardest part of the solution of the problem—how to obtain the power factor accurately. There is no instrument that records power factor with exactitude. The power factor indicator reads angles and not wave form. If the wave shape of the electromotive force and the current is distorted to any extent, it increases the inaccuracy of the power factor indicator, as these instruments are designed on the assumption that the curves of electromotive force and current are sine curves. Consequently, any charge based on the readings of the power factor indicator may be somewhat inaccurate.

Several methods in addition to the use of the power factor indicator are employed for obtaining the power factor, but I believe probably the most satisfactory one at the present time, is the use of two watthour meters, one connected in circuit so as to read the true power consumed and the other so connected as to read the "reactive" power.

By some such means as this a uniform system of charging could be maintained for all purchasers. Each customer could be charged for the true power consumed at a certain rate per kilowatthour and another smaller rate per kilowatthour for the reactive power. This method would be fair to all concerned, and it seems reasonable to suppose that it would eliminate many differences of opinion in executing contracts for purchased power.

The lower the power factor, the higher would be the reading on the reactive factor meter and the more it would cost the customer for the reactive power, whereas with high power factor, the reading on the reactive watthour meter would be less and the customer would have less of this power to pay for. In other words, the reactive watthour meter would simply be a penalizing meter for power factor, which is, no doubt, just.

When the customer would realize from his monthly bill what his penalizing cost is; he would in the majority of cases, be ready and willing to hear and learn of and install power-factor correcting devices, of which there are many, and the central station officials would have more absolute knowledge of the conditions, so that they could discuss the situation with the customer more intelligently from the average customer's viewpoint. The result would be increased efficiency and economy and should tend toward lower rates per kilowatt hour for power.

THE QUESTION OF FIXED SET OF RATES

Some central stations have a fixed set of rates which are supposed to cover poor power factor, and no doubt they do to a certain extent, but such a system of charging encourages poor efficiency, high operating costs and in some instances restrains prospective customers from purchasing current because of its excessive cost.

The above discussion has dealt entirely with the kilowatthour charge, but before concluding, it seems that something should be stated in regard to the method of charging for service or, maximum demand as it is termed.

There are several methods of making demand charges which are not fair. This is especially true of the method of charging on the basis of the horsepower rating of the motors connected to the line. The method of taking 3, 5, 15 or 30 minute demands by instruments seems unfair to the customer as it certainly increases his service or demand charge.

Since the alternators have certain full load ratings and hourly overload ratings, it seems fair to all concerned to base the demand or service charge on the demand covered over a period of one hour, and the printometer manufactured to print a record of the consumption each hour operates quite satisfactorily and introduces less error in printing every hour than would be introduced in printing every 3, 5, 15, or 30 minutes.

This article is not supposed to be a technical discussion of the subject, but is intended to furnish a fair idea of some of the factors causing discussions that create misunderstandings in the purchase of electrical energy.

It is noted in recent Commerce Reports that machinery is being recovered from Germany and from points in France and Belgium, on the way to Germany, where it was left at the time of the armistice. Some of this is badly worn by hard usage and some is damaged in transit.

New German-made machinery is available for quick delivery. The low value of the mark at the present time has created an inducement which cannot be overlooked by industries which must study economy regardless of other considerations. The supply of this machinery is limited, however, and there is no reason to believe that the Germans can arrange to give long credits in large amounts. Still, it is true that this situation provides the entering wedge for German machinery manufacturers, who may be expected to take full advantage of every chance to build up their business on a profitable basis for the future.

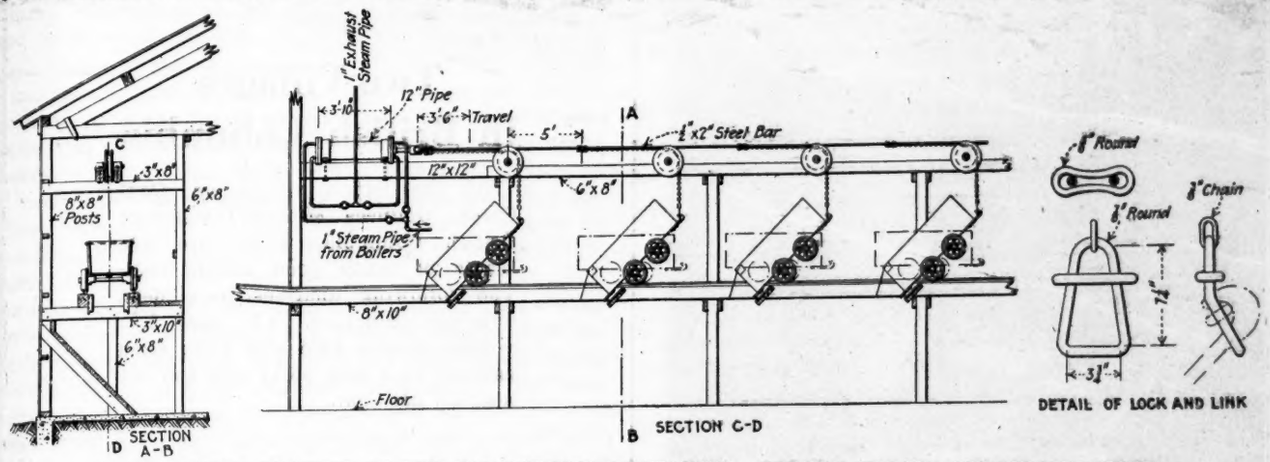
Dumping Boiler Fuel Into Coal Bunkers

By E. H. Weitzel
Pueblo, Colo.

The mechanism here described and shown in the accompanying illustration for simultaneously dumping six pit cars directly into the boiler coal bunkers was installed last March at the No. 1 mine of the Colorado Fuel and Iron Co. at Sopris, Colo. It has proved to be highly satisfactory and inexpensive in operation. The construction and operation will be readily apparent upon an inspection of the drawing.

The apparatus consists essentially of a long steel bar to the underside of which chains are fastened at suitable intervals by means of ½-in. U-bolts. One end of the bar is attached to the crosshead of a simple steam cylinder having a sufficient length of stroke to raise the end of the cars the necessary height for dumping. The piston is caused to move in either direction as desired by proper manipulation of the valves. Of course, a four-way valve substituted for the four simple globe valves shown would greatly simplify the control.

The loaded and empty cars are handled by a small hoist, and the entire operation of dumping the six cars does not exceed five minutes and is easily accomplished by one of the firemen. The apparatus was devised and built by A. C. Tolliver, mine mechanic, from old material picked up about the operation.



CONSTRUCTION DRAWING OF THE CAR DUMPING MECHANISM. DETAILS OF LOCK AND LINK ON RIGHT.

Illinois Mining Institute Holds Meeting

By Martin Bolt

The Illinois Mining Institute held its seventh annual meeting on Nov. 29 in the Council Chamber of the City Hall at Springfield, Ill. Notwithstanding the unsettled conditions in the coal industry which made it necessary that many of the members absent themselves from the capital city to transact more important matters elsewhere, the attendance at this meeting was large, and much interest was taken by those present both in the business and technical parts of the session.

At 10 A. M. on Saturday morning the Hon. Charles T. Baumann, delivered the address of welcome and William Hall, the acting president, responded. Thomas P. Back, state mine inspector of the Third District read an interesting paper entitled "The Relation of the Mining Inspection Service to the Coal Industry." In the general opinion of all those present the coal-mine industry as a whole is sincerely desirous of complying with all the provisions of the general mining laws.

After the members returned from their noon recess the officers for the year 1920 were elected. The nominations were quickly offered and as a result William Hall, of Springfield, Ill., was elected president, George Bagwill, of Harrisburg, Ill.; Frank F. Tirre, of Breeze, Ill., became the vice presidents, and Martin Bolt, Springfield, Ill. was elected secretary-treasurer. Thos. P. Back, Canton, Ill., Henry Fishwick, Springfield, Ill., Samuel T. Jenkins, St. Louis, Mo., Chas. Karrel, Georgetown, Ill., and James Taylor, Peoria, Ill. were reëlected members of the executive committee.

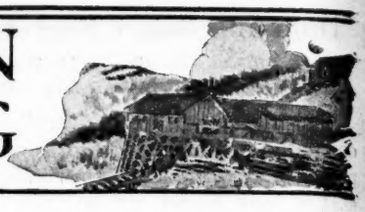
Thomas English, superintendent of the mine-rescue station at Springfield, Ill., then presented an excellent paper entitled "Breathing Apparatus and First Aid in Mining." This paper was freely discussed. The Institute later voted to recommend the extension of mine-rescue and first-aid work adding to it as their recommendation one for the provision of new equipment of such character as would maintain the stations at the highest state of efficiency. The institute decided that its next semi-annual meeting would be held in Chicago some time during the month of May.

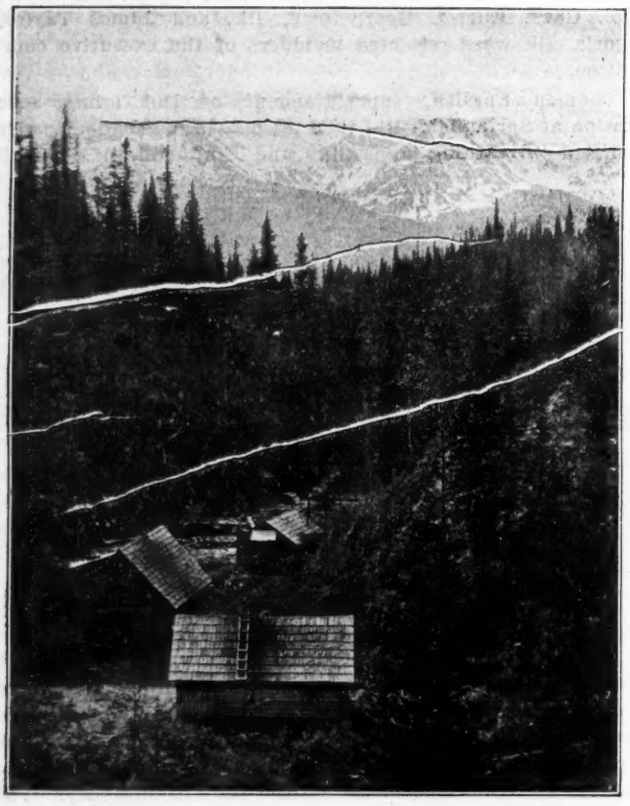
A banquet followed at 7:45 p. m. It was held in St. Nicholas Hotel and was the occasion of much jollity. William Hall acted as toastmaster with his usual grace of manner. Addresses were made by Joseph C. Thompson, director of the Department of Mines and Minerals, Springfield, Ill., Samuel T. Jenkins, of St. Louis, representing the Goodman Mfg. Co., and Thomas Moses, general superintendent, United States Fuel Co., Georgetown. Vocal numbers rendered by Master Aplett and the "Auld Scotch Songs" of Harry Marshall drew rounds of applause.

An Engineering Index

The library of the United Engineering Societies, of New York, regularly receives over 1100 periodicals, which represent the leading literature of the engineering profession both in this country and abroad. The annual volume of the Engineering Index, published by this society, has heretofore been based upon the classified system. It has long been the opinion of many who use the index, that a strictly alphabetical arrangement would greatly enhance the value of the volume. Accordingly, the journal of the American Society of Mechanical Engineers states that the items which form the 1919 Engineering Index will be alphabetically arranged, with liberal cross-references provided. A good index adds wonderfully to the value of a book as well as to knowledge in all other forms. Unclassified knowledge falls far short of hitting the mark.

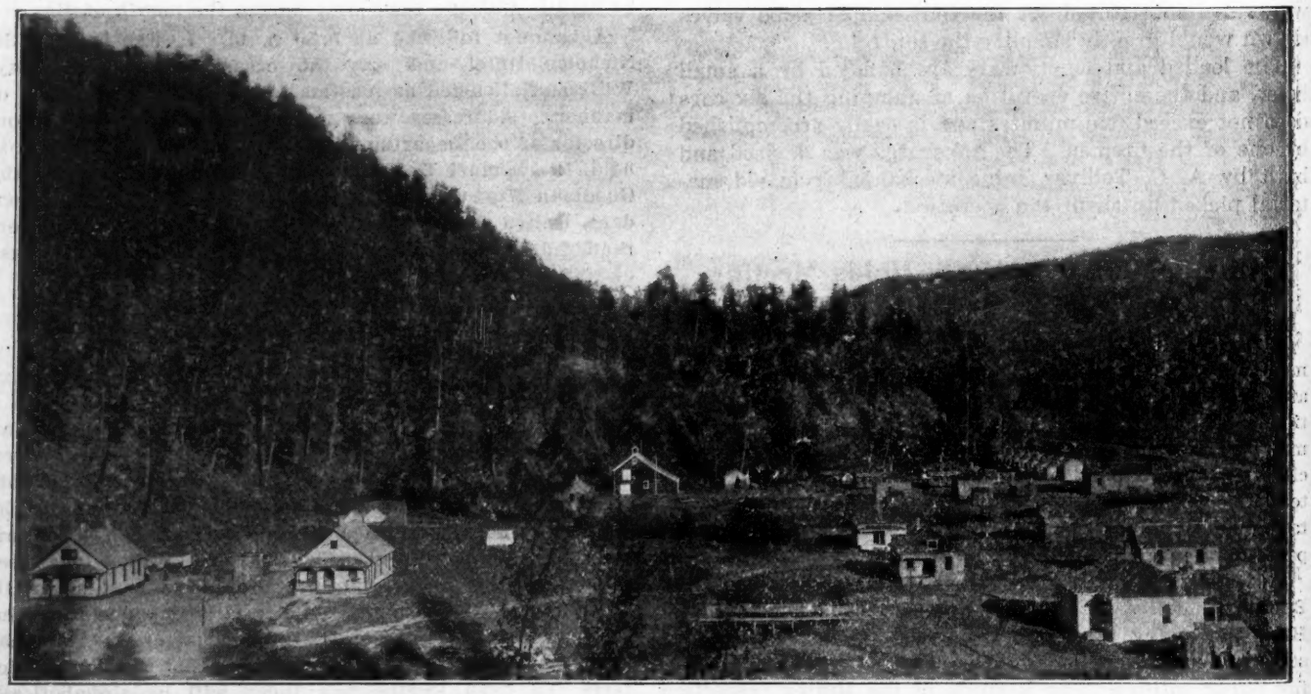
SNAPSHOTS IN COAL MINING





Two Villages in British Columbia

On the left a village on Coal Creek, Omineca Mining Division of British Columbia, where are five seams of fairly good coking coal. The following analyses have been obtained: Moisture, 3.3 and 3.9; volatile matter 34.5 and 31.2; fixed carbon, 56:1 and 55.1; and ash 6.1 and 9.8 per cent.



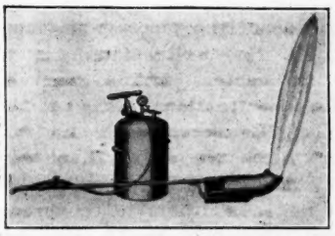
Coalmont, a Mining Village of the Coalmont Collieries Ltd.

This village is situated in the Similkameen Mining Division. The mines are distant about five miles and located on the north fork of Granite Creek. They were closed down for about two years but work was resumed in the spring of 1918, an airshaft for ventilation having been provided. The production is still not large, but the field is promising. Canadian coal mining engineers have different problems than their American brethren.

A New Thawing Device

The rapid handling of coal cars to and from the tipple during the winter with the least possible delay is the ambition of all mine owners, because this accomplishment means a great saving in time and labor, more important now, under present acute conditions than ever.

Returned empties with open hoppers frozen or clogged with ice, are hard to handle. Such cars necessarily have to be switched to a side track and in most cases labor-consuming methods employed to get them in condition for use.



VIEW OF THE DEVICE

One means of saving most of the delays, loss of time and labor, is to use the oil burner shown in the accompanying illustration. The manufacturer claims that one of those burners will thaw out hoppers and gate mechanisms on coal cars in four or six minutes; and that one man with one of these burners will do the work of eight men without it. The saving in labor alone pays the cost of the outfit within a short time.

As may be seen from the picture, the nozzle of the burner is so constructed as to shoot the flame upward against the hopper door without loss of heat. The flame flashes along the frozen door, thawing it almost immediately. The long handle makes the device exceptionally easy to use.

Besides thawing out gates and hoppers on freight cars, the same burner may be successfully used for thawing out frozen mechanisms on loading booms, conveyors, melting ice around water tanks and drips from water pipes, thawing out switches and the like.

This thawer is built for hard service and rough usage. Any laborer can easily handle it. The complete equipment consists of a 12-gal. steel tank for oil equipped with powerful 2-inch brass pump, gage, fittings, one 12-foot length of special oil resisting hose and burner with special elbow nozzle. The latter is an entirely new feature, assuring better satisfaction. The burner consumes from two to three gal. of kerosene oil per hour. This device is manufactured by the Hauck Manufacturing Co., of Brooklyn, N. Y.

Reductions in Freight Rates and Prices Will Stabilize Coal Market

Summer reductions in freight rates and coal prices as a means of fostering continuous operation was suggested by different coal companies to the American Mining Congress, who had sent out an inquiry to these companies asking their opinion of a resolution, adopted at St. Louis, asking for "such legislation as will permit coal operators to fix a definitely lower price for coal during such period."

There is now employed in the bituminous coal mining industry approximately 50 per cent more of active capital, coal mining machinery, labor and transportation facilities than would be required to meet the consumption demand of the country, if operation could be made continuous. If this surplus of capital, equipment and men could be released from the coal industry, the man-power remaining would be sufficient to meet the demand for coal—in other words, one-third of the total effort now applied or ready to be applied to coal production might be released for other enterprises in which the production of life's necessities would decrease the cost of living.

Any possible reduction of freight rates during the summer would not be sufficient to induce the purchase of coal by domestic consumers. Those industries which are operated continuously do not need this inducement, but, the domestic users of coal are disinclined to purchase coal during the summer months for the same reason as one correspondent expresses it that "we are unwilling to buy lawn-mowers and garden hose until we need them even though they could be purchased at a much less price in the fall".

The differential, to be effective, must be sufficient to represent: First—The interest upon the money from the time of purchase of coal until the coal is required for use. Second—The cost of storage and the waste and depreciation of coal during the period of storage, and third,—the possibility that the price of coal may become less during the winter months as a result of competition, or otherwise.

An inducement must be offered which will justify advance purchases. This means that the price of coal must be so stabilized that the producer is assured that the price is less than will be offered at the time of required use. This requires a stabilization of coal prices, which, under present conditions, seems to be entirely impossible.

A Prize Poster

It is customary every year for each division of the Engineering Department of the Lehigh Valley Coal Co. to vie with one another in getting out a cartoon indicative of the division.

The Susquehanna division poster shown below was entitled to first place. As this division was formed on Dec. 1, 1919, the cartoon is self explanatory.

WINNING POSTER OF THE SUSQUEHANNA DIVISION

Handling Fires in Stored Coal

By H. A. Ward

In the spring and summer of 1918 we stored 4000 tons of West Virginia nut and slack coal in an area about 140 ft. by 75 ft. This made a pile from 15 ft. to 20 ft. high. We endeavored to keep track of the temperature by occasionally going over the pile with ⅜-in. round rods sharpened at one end. By thrusting the rods down into the pile and allowing them to remain a minute or two and then withdrawing them we could tell by feeling the rods if the coal was heating and just how far the warmest spot was from the surface.

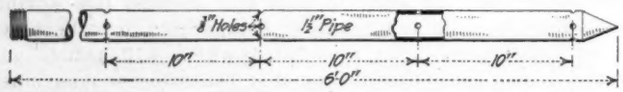


FIG. 1. THERMOMETER PIPE TO SINK IN COAL PILE

When we found a place which seemed to be getting too warm for safety, we would put down a 1-in. pipe and let a thermometer down into it so that we could determine if the temperature was still going up. The 1-in. pipe was prepared as follows: About 15 in. of one end was heated and flattened, thus closing the end. This flat portion was then given a twist like a drill or bit. By inserting this end into the coal and turning the pipe, at the same time exerting downward pressure, the pipe was easily driven through the pile.

Most of the coal was under a shed and in one small area it reached the roof of the shed. This interfered with the use of the ⅜-in. rod, and evidently this part of the pile was not carefully surveyed, as a fire developed about 15 ft. below the surface. To make sure that every part of the pile would be surveyed we put down 1-in. pipe as previously described, every ten feet.

We prepared ten pieces of sash chain the length of the pipes, placing rings in one end of each chain to prevent their being lost in the pipes. The ten chains were then let

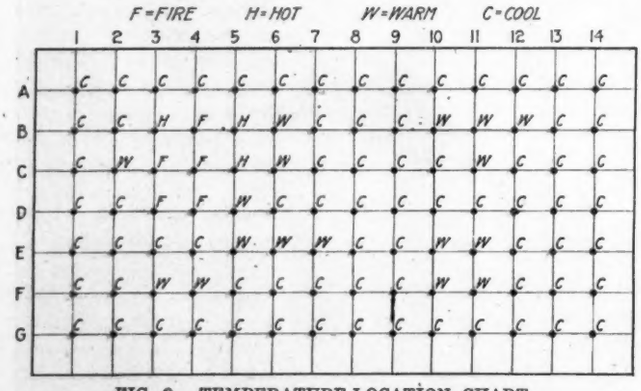


FIG. 2. TEMPERATURE-LOCATION CHART

down into the pipes. By the time the last chain was placed, the first chain would become approximately the same temperature as the pipe. By letting the chain pass through the hand as it was withdrawn it was easy to tell the approximate temperature of the station. It was also easy to tell the relative temperature at the various depths at the station. The stations varied in temperature from cool to red hot. In a case of a warm station not in the fire area we usually found that the bottom of the pile was cold, and that the temperature increased, to a point about 8 to 6 ft. from the surface, where it was maximum. From this maximum point the temperature fell as the surface was approached. Every second or third day the entire pile was surveyed, using a cross-section sheet as in Fig. 2.

For a week previous to the starting of the fire the weather had been very hot. We found several stations remote from the fire heating to a dangerous point. As all available labor was employed in digging out the original fire, I decided to try water on the hot stations. Two pieces of 1½-in. pipe each 6 ft. long were prepared as follows: One end of one of the pieces was closed by drawing it to a sharp point. In circles starting at this closed point and spaced 10 in. centers I drilled four ⅜-in. holes 90 deg. apart. These perforations extended the length of the one piece of pipe. The second piece pipe was fitted to couple to the first and to the fire hose. Then we sunk the perforated section into the coal at a hot station, coupled the second section to it and sunk them to the predetermined depth. After the water had been on 30 min. the pipe was moved to another point in the warm area, and so on until the area had been covered. This treatment brought the temperature down immediately. In some cases the treatment had to be repeated from time to time. We still have on hand the part of the pile, which was the most persistent in heating, and it has not had an application of water since the middle of November.

HOW ONE FIRE WAS CONTROLLED

The surveys soon demonstrated that the fire was spreading faster than our force could follow it, and that it must be headed off or the entire pile would be affected. By carefully checking between the pipe stations which seemed to be just outside the affected area to see that the fire had not extended a finger in between, I established a line just outside the affected area. The pointed ⅜-in. rods were used for checking between stations. On 6-ft. centers along this line we put down 1-in. pipe prepared as already described, but with the addition of ⅛-in. holes on circles 18-in. centers. This line of perforated pipes was connected with a common water supply pipe, the water kept on continually. The perforations above the surface of the coal were stopped with wooden plugs. This held the fire within the affected area. With this barrier established we sunk perforated 1-in. pipe into the heaviest of the fire and occasionally turned water into them. This checked the fire but did not put it out. I also did away with much of the smoke and gas which interfered with the digging out of the fire. Although the fire area extended over a space 50 by 40 ft., the fuel loss was comparatively slight. The coked areas were thin and only at the point where the fire originated did we find any indication of ashes.

TEXT BOOK VERSION IS QUESTIONED

Nearly all the literature I have found on the subject of heating and firing of stored coal has advised that as soon as the temperature of a station reaches 150 deg. F. the hot spot should be dug out. This is not always practical, as too many hot places may develop at the same time. Many of the articles advise that water seems to aggravate the trouble. I am inclined to believe that if a small quantity of water is used this may be true. The water leaving the hot coal flows through or under other parts of the pile not affected and thereby furnishes the initial heat to spread the trouble.

If a relatively large quantity of water is used, as in the case cited, the temperature of the water flowing through the coal approaches normal. For the same reason I believe that if water is used on the fire it should be in sufficient quantity, or the area treated should be sufficiently small to insure that the water flowing away through the pile should be of comparatively low temperature power.

Republicans Review the Work of Mr. Palmer

THAT the Republicans will lose no opportunity to make political capital of what they term the Attorney-General's surrender to class interests is indicated by a statement issued by the Republican Publicity Association in which the following points are made in connection with Mr. Palmer's negotiation with the officials of the United Mine Workers:

"1. The coal miners repudiated valid wage agreements, many of which would not expire until April, 1920, and demanded a 60 per cent increase in wages, with other concessions.

"2. The operators refused to grant the demands, but offered to arbitrate.

"3. The miners refused to arbitrate and ordered a strike.

"4. President Wilson denounced the strike as unjustifiable and unlawful, and called upon the miners to return to work.

"5. Attorney-General Palmer brought an injunction suit upon the allegation that the strike was unlawful, and secured a mandatory writ ordering cancellation of the strike order.

"6. The strike order was cancelled, but the miners did not return to work—which return was the chief purpose of the suit.

"7. While the miners were thus engaged in what the President and the Attorney-General declared to be an illegal act, the Attorney-General negotiated with them concerning compliance with the law and made terms satisfactory to them by which their return to work was secured.

"8. These terms included a concession of a material part of the strikers' demands, the appointment of a tribunal satisfactory to them to determine what additional concessions should be made, and conveyed an implied forgiveness of the illegal acts already committed.

"9. Although the operators had offered to arbitrate all the demands, as made at the time of the threatened strike, the Attorney-General granted part of the demands and then insisted that the operators had agreed to arbitrate the remainder, which they had never offered to do.

"10. If the agreement of the Attorney-General shall stand, the miners gain at least the concession already made, and may gain much more through the arbitration, forced upon the operators, thus demonstrating that unjustifiable and unlawful acts are profitable—in other words, that dishonesty is the best policy.

"11. If the Attorney-General's agreement shall stand, the Department of Justice thereby establishes the policy of negiotiating terms with criminals—for the Attorney-General declared the strike criminal, but said he preferred to prosecute the case in the civil courts.

"12. Success of the unjustifiable and unlawful acts of the striking miners will be due notice to all class interests that the way to win is to repudiate agreements and imperil the public welfare, thereby forcing the Government, through its duly authorized agencies, to yield at least a part of the demands and make agreements that may give to the lawbreakers all that they ever expected or hoped to secure."

T. W. Dawson States

"For the past fifteen years it has been the uniform experience that production has decreased in the proportion in which the pay to miners has been increased." The foregoing statement was made by J. W. Dawson of Charleston, West Virginia while testifying before the Senate Sub-Committee which is investigating the coal situation. Mr. Dawson was production manager for the Fuel Administration of southern West Virginia during the war. For the fifteen years just previous to the war he was president of the coal association of West Virginia. Other verbatum extracts from Mr. Dawson's testimony are as follows: "The Kanawha District of West Virginia was a very profitable coal region prior to 1902, at which time it was converted from a nonunion to a union district. From that time until 1916, with the exception of 1907, there was practically no profit in the coal business in that district. There was little or no increase in the tonnage of the district. In the Logan District of West Virginia and the Hazard District which are nonunion, there has been great development. While the Kanawha District stood still as to tonnage, the nonunion districts developed to their present capacity, due almost entirely to the difference between union and nonunion labor."

In an attempt to justify his statement that "the miners are now earning good wages and have plenty of money on which to live," Mr. Dawson laid before the Senators a set of statistics showing that the Washington wage agreement resulted in increases varying between 43 and 164 per cent. They received, according to Mr. Dawson, therefore, five years normal advances at one transaction. It gave them an advantage over other labor because they received a greater advance than was customary, or was given to other labor during the war."

Mr. Dawson challeneged the figures of the Secretary of Labor because he did not take into consideration that rents and many other of the costs of living at the mines have remained stationary for fifteen years. Mr. Dawson discussed living conditions at the mines at length and declared that miners pay more to the union by way of dues than they do for fuel. He estimated that the income of the miner's unions is at least $11,000,000 a year from dues. He gave actual figures covering workers' profits at the Cannelton Coal and Coke Company. On these he based various estimates as to miners' profits. He testified that

an energetic pick miner can earn between $250 and $350 a month, if he takes advantage of all opportunities to work. Despite the fact that there is some irregularity in the operation of coal mines.

Mr. Dawson pointed out that in the Kanawha District the miners this year have worked only 62 per cent of the time that they could have worked. "They do not want to work regularly. They can earn enough money without doing it. That is the actual record," he said. He also declared that while there was some response to the patriotic appeal to produce more coal during the war, there was a great deal of deliberate idleness. Mr. Dawson told the Committee that he had written the President several times during the war calling his attention to a situation which he typified by an example at Ashland, Ky. There the passenger train running between the mining district and the town was crowded day after day with men going into frolic "because they had so much money they did not know what to do with it". Mr. Dawson told the Committee that he regards the present wages of the coal miners as entirely commensurate with living conditions and favorably comparable with the wages of other skilled labor.

Mr. Dawson characterized the Washington wage agreement an unnecessary burden of 45 cents a ton on the cost of coal. Including the 14 per cent increase just allowed, $500,000,000 have been added to the cost of coal this year. He also told the Committee that he thinks he knows the very mine on which Mr. McAdoo based his 2000 per cent profit statement. "It is an old property in the Kanawha District," he said, "that had not been worked for 15 or 20 years. It had gone into the hands of receivers and was sold under the hammer for $1800. During the war that mine made $30,000 or $40,000, and undoubtedly did make its profit of 2000 per cent on that cost of $1800. That mine has not made a single dollar this year."

No Agreement Say Operators

On Dec. 20, after President Wilson's letter to the members of the Coal Commission was made public, the Executive Committee of the Bituminous Coal Operators' Association issued a formal statement saying the operators had "not agreed to any memorandum such as that mentioned in the President's letter....involving a basis of adjustment of the coal strike."

The statement said the operators had not been consulted in the strike settlement negotiations.

The text of the operators' statement follows:

"The operators have not agreed to any memorandum such as that mentioned in the President's letter to Messrs. Robinson, White and Peale, involving a basis of adjustment of the coal strike.

"The operators were not consulted as to the terms and conditions of the agreement entered into between the Government and the miners."

Attorney-General Palmer also issued a statement asserting that failure by the operators to agree to the Government's plan for settling the coal strike now "would be an amazing repudiation of their own statements." He added that the operators "official representatives have repeatedly agreed to" the settlement plan.

Mr. Palmer's statement also referred to testimony given recently before the Senate Coal Investigating Committee by Alfred M. Ogle, chairman of the executive committee of the coal operators, alleging the Attorney-General had suggested to the operators a compromise with the miners involving more than a 14 per cent wage increase before the settlement negotiations between the Government and the miners began.

Ogle told the committee the operators considered this proposed compromise "a cowardly and dastardly surrender of the rights of the public and the Government."

After quoting this portion of Ogle's testimony, Mr. Palmer's statement said:

"There is not a word of truth in that statement.

"Some difference of opinion had been expressed in the newspapers as to whether the offer to the operators of a 20 per cent increase in wages had been conditioned upon an increase in the price of coal. Mr. Ogle came to me on Friday, December 5, to deliver a written copy of the offer which had been made by the scale committee in the joint conference with the miners.

"I told his committee the Government had not the slightest intention of making any compromise of any kind or character, and proposed to stand squarely upon the position it had already taken, as announced several times by the President and myself.

Congress Thanks Miners for War Services

Mr. Goodykoontz on Dec. 18, 1919, introduced the following joint resolution, which was referred to the Committee on Military Affairs and ordered to be printed:

Thanking the American coal miner for distinguished services rendered the Government in time of war.

Whereas the war with Germany—the greatest war of all time—being over, and the soldiers, sailors, and marines of America, victoriously bearing the flag—the banner of freedom—having returned to their homes in this, the great Republic of the New World; and

Whereas the thanks of Congress, voicing the will of the American people, by appropriate resolution duly adopted, were extended to these honored soldiers, sailors, and marines; and

Whereas there is, among others, another class of men to whom credit is justly due, namely, the American coal miner, who, by unremitting toil and patriotic devotion, rendered a fundamental service to the country; who went down deep into the bowels of the earth and dug the coal that fired the furnace that forged the artillery and the boilers of the locomotives and the great ships that transported the troops and the munitions of war: Therefore be it

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the thanks of Congress are hereby extended to the American coal miner for distinguished services rendered the Government in time of war with the Imperial German Government.

Operators to Co-Operate with New Commission

Mr. Brewster stated on Dec. 22 that the operators as a rule have been clamoring for arbitration. More than that, they repeatedly stated their prefect willingness to go along with the Government in any plan that the President suggested. Their allegation now that they were not consulted about the form of the memorandum which was submitted to the miners' conference is absurd.

It was in fact submitted by my secretary to their representatives in Indianapolis, who communicated it to Washington, and no objection was made. The operators remained absolutely silent until after the men were back in the mines. Then for the first time they begin to object.

The miners went back to work in obedience to the law and the orders of the court without having their demands granted. They relied, as they had a right to rely, upon the

promise of the President that immediately upon complete resumption of operations a commission would be appointed to take up the matters at issue.

The officers of the Government had an equal right to rely upon the good faith of the operators in their previous declarations of agreement with this programme. The Government will not assume that the operators will break faith, and indeed ways will be found to see that all parties keep faith in this vitally important transaction.

The commission will proceed with its work, and I have no doubt that upon further reflection the operators will see the wisdom of hearty coöperation with this newly appointed body.

President's Indianapolis Statement

"In accordance with the request of the President, as contained in his statement of Dec. 6, the miners will immediately return to work with the 14 per cent increase in wages which is already in effect. Immediately upon a general resumption of operations, which shall be in all districts, except as to wages, upon the basis which obtained on Oct. 31, 1919, the President will appoint a commission of three persons, one of whom shall be a mine owner and operator in active business, which commission shall consider further questions of wages and working conditions as well as profits of operators and proper prices for coal, readjusting both wages and prices if it shall so decide, including differentials and internal conditions within and between districts. Its report shall be made within 60 days, if possible, and will be accepted as the basis of a new wage agreement, the effective date and duration of which also shall be determined by the commission."

This memorandum was telegraphed to the President and approved by him.

When the Attorney General's attention was called to the mine workers' interpretation of the memorandum, in which they say: "Under the present plan the mine workers are insured an immediate increase of 14 per cent in wages with the probability of further increases in all classifications of labor", he declared that it was the language of hope rather than an interpretation of the memorandum.

Commission Members Appointed

President Wilson appointed Henry M. Robinson, of Pasadena, California, John P. White and Rembrandt Peale members of the commission to investigate wages and working conditions in the coal industry, provided for in the strike settlement agreement.

Mr. Robinson will represent the public; Mr. White the miners, and Mr. Peale the operators.

During the war all three appointees were prominent in war work for the Government, Mr. Robinson with the Shipping Board, and Mr. White and Mr. Peale as advisors to Fuel Administrator Garfield.

Each of the appointees received in his letter from President Wilson, a review of conditions and actions taken in the past, together with suggestions which state that the public is to be protected. The importance of the new commission and its lasting service to the coal industry and to the country was emphasized.

The commission may set the price of coal according to instructions which read:

(1) If a readjustment of the prices of coal shall be found necessary, I shall be pleased to transfer to the commission, subject to its unanimous actions, the power heretofore vested in the Fuel Administration for that purpose."

Operators Oppose 3 Man Commission

The commission appointed by President Wilson to settle the bituminous coal strike is not "either in purpose or effect a public tribunal" and cannot effect a permanent solution of the difficulty, Thomas H. Watkins, chairman of the Central Pennsylvania Bituminous Coal Operators' Association, declared in a statement here last night, in which he protested against the limitation of the commission to three men.

"It isn't fair or reasonable to expect two men whose life work has been in the coal industry to reach a decision which may vitally effect the future of their associates," he said.

"There are questions of principle at stake which should only be dealt with by a tribunal upon which the representatives of the public outnumber representatives of the interested groups."

Mr. Watkins said that the operators considered the President's instruction to the commission "fine" and broad enough to cover the situation.

Frehlinghuysen Sees Public Buncoed

In a denunciation of the agreement reached between Attorney-General Palmer and John L. Lewis, acting president of the United Mine Workers of America, for settlement of the coal strike on a proposition submitted by the President, Senator Frehlinghuysen (N. J.), chairman of the Senate investigation committee, on Dec. 22 expressed the fear of a secret arrangement somewhere in the deal which would plunder the American public.

Attorney-General Palmer in a statement declared the stand taken by the coal operators against the proposal was the merest quibble, and he concluded:

"The Government will not assume that the operators will break faith, and indeed ways will be found to see that all parties keep faith in this vitally important transaction."

With this threat, he says he believes the operators after reflection will see the wisdom of coöperation in the settlement proposed.

Northern Coal Co. Case Dismissed

The Interstate Commerce Commission has dismissed the case of the Northern Coal Co. operating near Millstadt, Ill., against the Mobile & Ohio R. R. The coal company, the operator of a stripping proposition alleged that the railroad was subjecting it to unjust discrimination in the allotment and distribution of coal cars.

The commission held that in view of the coal company's physical disadvantages, recurring interruptions in operations and irregularity of production, that the record does not show that it was possible for the coal company to have loaded more cars than actually were furnished by the railroad, notwithstanding the fact that it received a relatively less percentage of its pro rata than did the shaft mines.

Hines Talks Coal to the Cabinet

On Dec. 23, Director General Hines of the Railroad Administration was called before the regular meeting of the cabinet. He said he had no information as to what President Wilson intended to do with regard to turning back the railroads.

The cabinet was in session less than two hours. Secretary Lansing, who presided, said Mr. Hines was summoned for a discussion of the coal situation, and that the reports he made on production were encouraging. The railroad question was not discussed, Mr. Lansing said.

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Uneasy College Students

EVERY EMPLOYMENT draws on three elements —craft (a training of the body and of the mental reflexes), education (a training of the brain) and business (a training of the judgment). The engineering profession requires parts of all these elements. The college student usually persists in overlooking all but the second one, or in thinking that his college training will give him all three.

Repeated operation and repeated use will alone give accuracy, rapidity and certainity in any kind of labor. It is doing and redoing and doing again that gives us a craft. The college professor gives a scholar a problem once and he solves it perhaps with accuracy but usually without rapidity or certainity. Practice is the only thing that will add craftsmanship to knowledge.

When the everyday labor of the student brings him face to face with a certain problem day after day, then it becomes a second nature, something done almost without thought. In fact knowledge is really not properly acquired till it becomes so rooted as to operate without mental effort.

The college student has been passed so rapidly from problem to problem in his years of instruction that when he enters the professional world he is discontented. If his professor had taught him the same principle on two successive days he would have regarded it as a waste of time. In his new occupation he may do the same thing repeatedly, for days and even years together. The value of his training is that it teaches him not to solve once a single problem, but how to solve it repeatedly, and he has to learn the duty of enduring the sameness of almost endless repetition.

Facility, rapidity and accuracy must be added after the student leaves college. In college he must learn to think and, after college, to work without over-much thinking, at the main duties of his profession, rather from an acquired habit than from an effort of mind, and he must give labored thought only to forming the right habits and methods and in the meeting of the occasional and exceptionally difficult problems. In short his profession and his art must eventually become largely a craft. The hand must save the head. Until that time comes, his work will be labored and not productive.

Furthermore, in college he was regarded as a product, on which must be bestowed labor, care and skill. After he leaves college, he becomes a producer. The trinity of attention just mentioned is not now to be expended on him, he is to expend it on his product. He is no longer therefore principal interest. Over the college might be written "Here we make men" and over the mine "Here we produce coal." It will be seen that the man is no longer the end product but the means. The glory of the college man is gone and should be forgotten. He rides no longer; he is now to put his shoulder to the wheel. If he forgets that, he overlooks the whole purpose of his college life.

Not much so far has been said of the forming of the character, the judgment or the business quality of the man. Too many young men from college cannot listen. Some are too prone to talk and interrupt the speaker but still more cannot concentrate on what is said to them. Part of that quality is the mere exuberance of youth, and part a result of an attempt to appear well posted and competent, while part arises from a superabundance of conceit.

A somewhat dull but attentive, patient, modest college man will often succeed where an average student, who is in addition hasty, impatient and self opinionative, will fail. Let no one think that the ignorance of a graduate, if confessed, will do him much harm. The chief to whom he is accredited will usually be ready to explain; in fact, let it be said in secret, it rather flatters him to do so. If the chief crows a little over it, do not be alarmed, it is only a sure sign that he is the more flattered. If he blusters, do not worry, for, if after explanation, even laboriously given, he gets the results it is a triumph for both. But if he offers suggestions and they are unheeded, if he gives orders and they are unfulfilled and as a result the work is done wrong or not on time or at great expense or men are laid idle, the fault can hardly be excused. The man is neither a good worker nor a capable tool, and nothing can be said for him.

As for the student's judgment be it said there are a lot of socialists among students in colleges and a lot of bumptious autocrats among those who come out in the world. They talk in college halls a lot of nonsense about the equality of all men and come into the field with all kinds of overweening ambitions and longings for authority and too often with a horror of that work which in college they so generously lauded.

In closing be it said that colleges have violated the rules of advertising. They have spoken too freely of their ability to fit men to work. They fit only those men who can be fitted and do it only in a degree and that is all that can honestly be claimed. The promises they make to their students are usually too large. They give only a third, the important third perhaps, of the training required. The atom hydrogen is necessary to the forming of potassium hydroxide, but it is no more necessary than are the atoms of potassium and oxygen. Similarly education is necessary to the engineer, but so also are craftsmanship and judgment. The college must leave these to the mill and to the mine, for the first comes only with toil and the second only with trouble.

Not What We Get But How We Get It

SHOULD A MAN GET a gift of money it is his by right, but if he gets it by compulsion, that is stealing; or by conspiracy and combination, that is, or should be regarded as, an illegal act. If with others the miner denies to his neighbors coal for their domestic fires, fuel to run their machinery and heat to bake their bread that is a form of compulsion, whether peaceful or militant. It may be fair to take the highest wage offered, to shop around one's talents, to create a demand for one's ability and energy, but it is unfair to combine with others to suddenly cease work and let the world go cold and hungry.

Many do not understand this difference, a difference on which the good fortune of the world is based. Under natural economic laws if a service or a product is much needed much will be offered for it and more of that service or product will be forthcoming. If it is not needed the service or product is withdrawn from the market and the man who has rendered the service or furnished the product looks around for a service that *is* needed or a product that *is* demanded. There is an advantage in the

higher price, for it draws out the needed service or product, and an advantage in the lower price, for when the need is satisfied further production should be discouraged.

With unions of workmen and unions of employers—the latter alone, for some inscrutable reason, we term trusts—prices when raised at a time of big demand are apt to be forcibly kept high when the demand fails. It is not well that a union should profit unduly by high demand because when the demand ends the wage will be sustained by the contracts it has made.

The unions say that winter prices are high, therefore wages shall be raised, and with this specious argument they demand a contract running over the summer months when prices would normally be lower if the wages were not advanced. A trust cannot be dealt with as if it were an industry that is still responsive to the law of supply and demand. It must not be allowed to use the law in the winter and hold it in abeyance in the summer to the disadvantage of all who must buy of that trust.

Profits under the law of supply and demand may well be allowed to be unduly large at times, for at others they are apt to be inordinately small, but the profits of trusts are so certain that they may well be kept at a reasonable level. Where there is provided the security of a bond, then the compensation must be regulated, and the excessive profits of one season must not be made the normal profits of all the months of the year.

Paying Dearly for His Dilatoriness

EQUAL TREATMENT TO ALL is not to be the rule of the coal industry if Railroad Director Hines has his way. He is insistent that the coal which is overdue to the railroads be delivered first, and that other coal users wait till the needs of transportation are fully satisfied. The reason for his demand is that the railroads are in hard straits for coal, and if they do not get it, the movement of industry will stop.

There is no denying the logic of Director Hines' position, but it is to be regretted that he did not think of the need for coal earlier, in that period of the year during which the railroads in their private ownership days had been accustomed to stock coal. He would not buy fuel then, but when the strike came he commandeered coal right and left, and he now follows that action by jostling his way ahead of the waiting line like a late arrival at the ticket window.

The necessities of the situation cannot be denied, but there is little excuse for them. Had Director Hines stocked up in the spring, his coal piles would not now need replenishing and his cars would not be so generally distributed the country over. It will be a menace to the public if once the railroads learn to depend on a sort of right of eminent domain to help them out of the fueling difficulties in which they may involve themselves by their dilatoriness.

Childish Presumption

FOR 23 MONTHS the railroads have been conducted at a financial loss of 548 millions of dollars. The actual deficit is probably more as the railroads are not being properly maintained. The freight and passenger rates are set by the Government yet they fail by 548 millions of being adequate to supply transportation under the aegis of the United States Railroad Administration.

How can it be expected that the Interstate Commerce Commission can prognosticate what percentage any given freight and passenger rates will pay? It has been guessing for years and it invariably guessed wrongly. The judgment of the Commission is like the judgment of a gambler who figures that the roulette wheel is going to stop opposite his figure. It may or it may not. The chances against him are ten to one.

The Interstate Commerce Commission always concludes that, if a good year comes, a fair profit will be made at the phenomenally low rate allowed. Only rarely does the good year come. Usually a bad year is all that presents itself, and the rate is found wholly inadequate. The profit in the full years is not enough to make up for the losses in the lean years. The Commission goes daily along guessing at the industrial barometer as the Weather Bureau guesses at the weather barograph, and the railroads go further and further to perdition.

Is it not pertinent to ask this question: If the United States Railroad Administration spending the Government's money has not courage enough to put up rates where they belong, will the Interstate Commerce Commission find the courage to do so while spending not their own but the railroads' money?

More Society Conscious than the Socialists

MOST OF US, fortunately, are more social than the socialists. That is most of us believe that selfishness is not rampant in the world. We believe in our fellows; we know they do many acts for the good of the public and not for their own advantage, but the socialists believe that every one is greedy and grasping and for this reason they would change the order of things.

But if we are more selfish than social, then socialism appeals to, and, if established, must endure, if it does endure, by reason of, a quality to which socialism denies existence; that is it must be a failure. When we remove reward from toil and financial risk and embrace socialism, no one will toil or take risks, unless men are what socialists affirm they are not.

Most of us believe there is a large degree of honesty in mankind, that many of us like to work even without reward, that many have a sort of institutional or craft pride that keeps them busy. Many a hard-working laborer, clerk or capitalist has those qualities that would make them almost mainstays of socialism, should such a system be by any unhappy chance introduced, but unfortunately they are not so general, or rather so universal, that we could rely on them to turn the trick.

Strange to say the socialists claim that these virtues are not to be found or are seldom to be found and, if that is so, where is the hope of socialism, for that creed is based on the idea that in the perfect State everyone will have a co-operative mind and an honest intention and will assist without reward in the upbuilding of the State.

Unfortunately for socialism, the socialists are with a few admirable exceptions, the greediest of the greedy. Jealousy is one of their most marked traits. They have a grouch because they cannot outvie others in ease, in comfort or control. They are like the superdemocrat who believed that "one man is as good as another—and some a durned sight better." They believe they are among the better and should have more than others and be masters of their destinies. Their socialism is not socialism at all but revolution—a mere overturning by violence, in which they hope to be gainers.

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Standardizing Mining Equipment

Letter No. 1—The Foreword, "Coal Age", Oct. 30, on the need of standardizing all equipment in coal mining, was an excellent and timely article viewed from the standpoint of economy and efficiency.

Next to labor, good equipment is essential to maximum production. It goes without saying that the best is always the cheapest in the end. The most uptodate mines have the best locomotives, pumping machinery, drilling and cutting machines obtainable; and the most reliable manufacturers are putting on the market only the most improved mining equipment.

However, like all other equipment, even the best types of mining machinery have a limited life. No machine will last forever under the severe service to which it is subject in mining; but repairs and renewals must be made from time to time, and it is these items that cause an expensive handicap when there is a lack of standardization of the parts that require most frequent renewal.

The chief concern of many uptodate companies is to keep on hand a sufficient supply of all renewal parts to avoid delay when a breakdown occurs. This plan makes it possible to repair the damage and put the machine in operation again with as little loss of time as possible. Every operator realizes the importance of keeping these parts on hand, since he never knows when a breakdown will occur. It may result from the parts being worn and, in that case, he is able to estimate about when a renewal will be necessary. But, the breakdown may result from a defect in the parts or be caused by a wreck neither of which can be foreseen; hence the need of being prepared for such occurrences.

It is clear that where two or more types of locomotives, mining machines, pumps and other equipment are in use, the number of repair parts required to be kept on hand will be so large as to be a burden, and an operator will often take a chance and delay ordering when any of these parts kept in stock are exhausted, thus putting far off the evil day.

IMPORTANCE OF STANDARD EQUIPMENT

For these reasons alone, it behooves the operator to standardize his equipment as far as that is practicable, and avoid the use of too many different types of machines for performing the same work. It is easier and more economical to keep all, or nearly all, of the most essential parts of a machine on hand, than it is to have about one half of the parts of two or more types of machines.

The standardizing of the equipment of a large mine employing different types of machines is a difficult matter and cannot be accomplished in a day. In many instances, it will not pay to change the equipment in a mine for the sole purpose of standardization. It is a question that must be determined by the existing conditions, and these may require different types of machines working in different places in the mine.

However, the standardization of a particular part of the machinery, as for instance, the adoption of a standard mine car, standard track material, etc., will generally prove of great advantage. The average mine has a car-repair shop, where men are kept constantly employed renewing the broken or worn parts of the mine cars. It is evident that much time and labor will be saved with a proper standardization of the cars in use. The same is true of track frogs and switches.

Repairs and renewals on a single type of any class of mining equipment require a considerable stock of supplies to be kept on hand at a large outlay. What would be the nightmare of costs for repairs where several different types of machines are employed in a mine? Besides the actual cost of the part renewed, there is the labor required, to say nothing of the delay caused when the needed part is not on hand.

In a few years, much if not all of the mining equipment will be standardized; and not until then will we be forcibly reminded of the present inefficiency in this regard. Standardization of mining equipment is as necessary as the standardization of threads on bolts and pipes.

Thomas, W. Va. W. H. NOONE.

Letter No. 2—Many men engaged in the practical operation of coal mines, as well as manufacturers of mining equipment, have doubtless been greatly interested in reading the Foreword that appeared in "Coal Age" Oct. 30, urging the careful consideration of the adoption of fixed standards, such as were recently suggested and discussed at a meeting of the American Mining Congress.

The most casual observer, who is at all acquainted with mining conditions as they exist today, can hardly fail to note the great lack of standardization in the equipment of coal mines. This is particularly true in respect to certain large mines that have been in operation a number of years. Perhaps, in no class of equipment is there a greater variation noticeable than in the size and style of the mine cars in use. Some are large, others small; some have large wheels and others much smaller wheels; while it is not unusual to find the capacity of the cars varying almost a ton.

Any of the workers in the mine, from the superintendent down to the trapperboy, can tell you that some of these cars came from such a mine, and others were brought over from another place that was soon to be abandoned. The conclusion is that the purpose of the company has been to economize by utilizing material that would otherwise be sold at a great loss or scrapped.

The argument in support of such plan for economizing by sending into the mine any class of equipment that is available appears at first glance to be well advised. However, viewed from another point, it is questionable economy and cannot fail to add more to the cost of operation than is saved by utilizing the old material.

Take, for example, a mine that was originally equipped with a size and style of car that was adapted for use in that particular mine. As time rolls on, some of the cars are worn out and others so demolished by wrecks that they are beyond repair. At the same time, the steady development

of the mine requires more cars to handle the growing output. It frequently happens that the owners of such a mine have an overplus of cars at another mine that is nearing completion. Although these cars are of a different style and capacity and may even require having their axles replaced owing to a difference in trackage in the two mines, it is thought that a saving can be effected by utilizing the old cars in the operation of the newer mine.

When such conditions of promiscuous equipment have taken place two or three times in a mine, it requires no wise head to discern that there is trouble in store in the future. The difference in the capacities of the cars may not make so much difference in operation, although it requires the same amount of time and labor to handle a small car from the face of the coal to the tipple as a larger car, within reasonable limits.

The chief trouble arises when the sizes of the wheels and axles do not correspond to those already in use at the mine, and it is necessary to keep on hand these different sizes. Superintendents, mine foreman and other officials who are responsible for keeping up the output of a mine and increasing the daily tonnage will not fail to recognize the handicap that this lack of standardization means in the daily operation of the mine.

COMMON CAUSE OF DELAY IN MINES

For example, the following, though not an actual occurrence, is an accident that is being duplicated every day in mines where the equipment is not standardized, as any practical foreman well knows. Assume, for instance, that, in a mine where a motor is hauling a long trip of loaded cars of various styles and sizes, one of the cars is derailed. The fact is at once known to the motorman by the action of his locomotive; but, before he can bring the moving loads to a standstill, the jumping of the derailed car over the ties has caused a broken wheel.

If this mine was well equipped, such an accident would mean only a short delay in getting another wheel to replace the broken one. In this instance, however, no surprise is felt when, another wheel being brought, it is found not to be the required size. Then, a hunt is started for a larger wheel, and someone remembers that there is an old car with a broken axle in the mouth of an abandoned room, a distance up the entry. It takes time to pry the wheel off from the axle of this car; but, alas, when it brought it is found that the bore of the wheel is too small for the axle of the car and this wheel, like the preceding one, is thrown aside as useless.

Under the circumstances, there is nothing else left to be done but to get the car to a place where it can be set aside for the nightshift to handle, if indeed they are fortunate enough to find a wheel that will fit the axle. This causes a long delay and hard work is required to get the car to its resting place.

In a large mine, other motormen waiting on a passing track are delayed by the accident, and it is nothing unusual for the entire mine to be tied up by such an occurrence, which all practical mining men know can be avoided by a proper standardization of the equipment employed. What seems to be economy is thus shown to result in unnecessary expense and curtailed production.

This country has always been the home of standardization of both methods and material. The idea originated here in the development of the system of interchangeable parts, in the manufacture of instruments and machines of every description. The lack of standardization was a serious handicap to England, at the start of the war. Almost every machine was a separate creation.

In beauty and efficiency of standardization, in manufacture, was shown in the rapid building of the enormous number of Liberty motors, in this country, for transportation across the sea. Henry Ford's success in the production of his "Tin Lizzies" is another striking illustration of standardization. Everything about a Ford will fit any other Ford, and a missing or broken part can be obtained at almost any dealer of auto supplies and at many department stores.

One great need of standardization, in coal mining, is in the adoption of a uniform track gage. The standard gage of railroads, in this country, has been the basis of the great expansion of that business; but, in this respect, our mines are still holding to the practice of the dark ages.

Standardization is evident in the moving-picture business, electric lighting, gas fitting, and plumbing and in numerous other industries. There is even a universal keyboard for typewriting machines. But, our mines are flooded with coal-cutting machines of every kind and make; and there is little standardization of wheels, cutting bits and other parts of mine equipment. The question of standardization may well be considered in respect to the armatures and fields of motors, electric fuses for pumps and other machines and, in fact, in every department of mine equipment.

It would not be good policy to advocate excluding the new models of machinery that are being constantly added to the equipment of mines, because of the lack of standardization and need of maintaining a larger number of supply parts. On the other hand, the introduction of these new models would be greatly advanced if there was more standardization in the manufacture of both old and new machines. Coal mining is yet in its infancy. It is readily recognized that it may be impracticable to standardize all classes of equipment; but much can be done, in this regard, in the manufacture of mine-car wheels and axles.

Roscoe, Penn. ALEX. S. DIXON.

Boiler House Economies

Letter No. 1—I was glad to see and read the article by E. P. Humphrey, "Coal Age", Oct. 2, p. 570, who draws attention to the great waste of fuel that occurs in the generation of power. As he states, little attention is paid to the matter of economizing fuel, in the power house of large collieries, where seldom any account is taken of the coal burned under the boilers.

Allow me to mention a few points based on my own experience, in relation to the firing of boilers and the equipment necessary for generating steam with a view to economy of operation. The subject is one that should appeal to coal operators and mine officials just as strongly, in respect to lowering the cost of operation of the mine, as it does to manufactures and shop superintendents, in reference to the generation of power, heating and lighting.

Frequently, the size of coal used in the colliery power house is too small for the grate, which was originally intended for burning a larger coal. As a result, much of the fine coal in use falls throuh the grate into the ashpit and goes out to the dump with the ashes.

The average fireman at a colliery and in many industrial plants as well has no exact knowledge of the amount of coal that can be burned economically, per square foot of grate surface. The tendency is with many firemen to pile too much coal on the grate, which is done at the expense of efficiency in burning the coal. Less heat is transmitted

to the boiler and a larger amount passes into the stack, partly owing to the stronger draft required to maintain the fire, and partly to the fact that less heat is radiated from the surface of the burning coal. In addition, there is a greater tendency for the coal to clinker, and this requires more shaking of the grate and cleaning of the fire, and much partly burned coal drops into the ashpit with the cinders.

To overcome this difficulty, forced draft is employed, with the result that a larger proportion of heat passes into the stack, the heating surface of the boiler being insufficient to absorb its due proportion of the heat from the burning gases. Every fireman should understand the proper amount of air required to burn a given weight of coal. Too much air cools the flame, burns out the coal and carries too large a proportion of the heat into the chimney.

BURNING DIFFERENT GRADES OF COAL

Particularly at collieries, firemen are compelled to burn different grades of coal, for which there is not the present demand. In that case, it is well to remember that the finer the coal the greater will be its tendency to cake. Such fine coal should be spread over a larger area of the fire to secure its more rapid combustion; and greater care is required in cleaning the fire to prevent the fine coal from falling into the ashpit.

In the firing of the size of coal that is adapted to the grate, the fresh coal should be heaped in a little pile on the front of the grate and allowed to remain there until sufficiently kindled that it can be spread over the surface to the burning coal, without damping off the heat by smothering the fire. This method of firing is known as the coking method, and has the effect to maintain a more uniform temperature in the furnace.

Too often, a fireman will fairly smother a fire with fresh coal, and it may require 10 or 15 min. for this coal to kindle and restore the heat of the furnace. In the meantime, the steam pressure has dropped, the furnace cools, and loss results before uniform normal conditions can be again established. As a rule, these green hands at firing know it all and cannot be told anything. They have fired boilers too long to need any instruction in that line.

In the design of a power plant, it often happens that the boiler is too small for the steam pressure required, in which case, there is no end of trouble ahead. The steaming capacity of the boiler is not proportioned to the amount of coal that must be burned to accomplish the desired results. The grate area, which generally bears a fixed ratio to the amount of heating surface, depending on the type of boiler in use, is not sufficient to burn the required weight of coal per hour.

STEAM PIPES AND BOILER CONNECTIONS

A word or two regarding boiler connections will not be amiss here. All steam pipes should be covered with a fireproof material that is a poor conductor of heat. This will reduce the condensation of steam in the pipes and lower the cost of generating power. Where pipes are uncovered, there is a large loss of heat due to radiation, and other trouble arises from the condensation of the steam in the pipes. This produces wet steam and requires the separation of the entrained water, which is liable to be carried over into the cylinder and, perhaps, cause a cracked cylinder head or do other damage.

Boiler connections should be so constructed as to avoid low places in the pipes where water will collect from the condensation of the steam. This will produce water-hammer, which may be of sufficient violence to burst the pipes, blow out a valve, or break a pipe elbow. Wherever there is an opportunity in a pipe line for water to collect, dripcocks should be placed at such points. Also, whenever two or more boilers are connected to the same steam main, forming a nest of boilers, there should be two valves on each connection, so as to insure against danger to the workmen when making repairs on a boiler that is cut out for that purpose.

Rawdon, Quebec, Canada. C. McMANIMAN.

INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD

Return Wire in Trolley Haulage

In our mine, we are using the trolley system of hauling and have had to consider the question of installing a return wire. In this connection, I want to ask, At what distance from the trolley wire should the return wire be placed to insure safe operating conditions and where it would not be injured by the pole. We are using direct current, with a pressure of 550 volts. Also, let me ask, At what distance apart should the taps be placed connecting the return wire with the rails?

Albert, Tucker Co., W. Va. MINE ELECTRICIAN.

Judging from the information given in this inquiry, we assume that it is desired to install a return wire for the purpose of improving the service, the possible poor bonding of rails having rendered the rail return inefficient. Before replying directly to the questions asked, regarding distance apart of the trolley and return wires, and the taps connecting the latter with the rails, however, we would suggest improving the bonding of the rail, so as to enable a good return through them, which would do away with the necessity of installing a return wire. If this is a main-road haulage and must be maintained for some time to come, it will pay to rebond the rails and fix up the roadbed so as to secure the best possible results in haulage.

But, assuming that it is absolutely necessary to install a return wire that is to be operated in conjunction with the return through the rails, which seems to be the idea presented by the suggestion of taps, it can be stated that it will be necessary to have as many taps connecting the return wire with the rails as there are imperfect bonds between them.

If this is not done, whenever the locomotive occupied a position between two imperfect bonds it would have an imperfect return, or perhaps no return at all, except what might result from the grounding of the track. For this reason, each section of rail between imperfect bonds should be connected with the return wire by a tap. At the best,

the plan suggested is a very poor one, and is liable to give no end of trouble.

If such a wire is installed it should be hung from the timbers, on the opposite side of the entry from the trolley wire. Some will prefer to lay the return wire at the side of the track as close to the rail as practicable, in order to reduce the length of wire required for the taps connecting it with the rails. If this is done, the return wire should be suitably guarded to protect it from injury by falling roof or derailment of cars, either of which is liable to occur and cut the wire.

Guarantee of Work of Mine Fans

A discussion, which took place at a mine foremen's monthly meeting that I attended recently, developed a question that is of much interest in the purchase and installation of a mine ventilating fan. We were arguing on the effect that would be produced on the water gage should the fan be cut off from the mine. I claimed that there would still be a pressure at the fan, but was unable to explain how this was produced, and agreed to write COAL AGE for an explanation.

In the same connection, the question was asked whether it is the custom for manufacturers of mine fans to guarantee that the fan will produce a given volume of air, against a certain specified water gage, when the fan is running at a given speed, say 60, 80, or 100 r.p.m.

Also, in making such a guarantee, do fan manufacturers take into consideration the mine resistance, or does the guarantee refer to the fan running in the open, that is to say cut off from the mine? I hope I have made my meaning clear and that COAL AGE will soon resume its regular weekly visits that have been interrupted by the strike of the printers.

McIntyre, Penn. THOMAS HOGARTH.

Twenty-five years ago, it was the custom of mine operators and fan manufacturers to estimate the capacity of a fan by its yield in cubic feet per minute. When ordering a fan, the operator would state the volume of air required to be delivered, and the manufacturer would guarantee his fan to produce the specified volume of air, but making no mention of the water gage, ignoring the fact that it is the measuse of the resistance against which the fan must operate and a determining factor of the volume of air the fan will produce at a given speed. At that time, even the speed of the fan was seldom mentioned, so that if a fan failed to produce the required quantity at a normal speed, this was increased until it met the requirements of the guarantee of its maker.

Attention has since been drawn to the fact, which is now clearly understood and recognized, that, for any given power on the air, the unit pressure or water gage varies inversely as the volume of air circulated, in a given airway or mine. It has been further shown that the unit pressure or water gage is due to the resistance offered to the passing of the air circulated by the fan.

In order, therefore, to estimate correctly the capacity of a fan, it is necessary to specify both the speed of the fan and the water gage at which it will produce the required volume of air. Today, the three elements, volume, gage, and speed, are all specified in the guarantees made by reliable fan manufacturers.

The foregoing explanation should make clear the fact that when a fan is run in the open, by which is meant both the intake and discharge orifices of the fan are open to the atmosphere, the fan may produce a large volume of air but there will be no resisting pressure, except that due to the circulation of the air through the fan, and no water gage will be produced in the fan drift now open to the atmosphere.

On the other hand, assuming the power applied to the fan shaft remains constant and the fan is either exhausting or discharging air into the mine, a resistance is set up in the fan drift and the volume of air produced by the fan is greatly decreased. The amount of this resistance is measured by the water gage.

It is evident, therefore, that the same fan operated by the same power will produce a different volume of air, at mines having different powers of resistance. The resisting power of a mine is measured by the ratio of the quantity of air in circulation to the square root of the unit pressure. This ratio is properly termed the mine potential, and is an important factor in all fan calculations.

Expansion of Spiral Fan Casing

It was with deep interest that I read and studied the reply to a recent inquiry entitled, Design of Ventilating Fan, "Coal Age", Oct. 30, p. 724 It is this sort of information that many of the readers of "Coal Age" are desirous of obtaining, especially those of us who have such work in charge and are responsible for the proper design and construction of all mining equipment.

As stated in the reply to this inquiry, the proper proportionment of a centrifugal fan is a difficult problem. I fully realize that the several dimensions of the fan depend on a number of factors, which greatly complicate the solution of such a problem. However, I want to ask one question. How is the proper expansion of the spiral casing of a centrifugal fan, at the point of cutoff, determined? Without knowing this factor, it would be impossible to construct the circular templet mentioned in this reference for laying out the spiral of the casing. It is stated that the diameter of this templet is three-eighths of the expansion of the casing at the point of cutoff.

Greensburg, Penn. W. A. UNDERWOOD.

The expansion of the casing of a centrifugal fan, at the point of cutoff, must be such that the velocity of the air at that point shall be equal to or slightly greater than the velocity of the blade tips. This velocity (u) of the blade tips (ft. per sec.) depends on the theoretical water gage, which may be assumed as 1.4 times the gage in the fan drift. The blade-tip velocity required to produce the water gage w. g. in the fan drift, under normal conditions, is then calculated by the formula

$$u = 56\sqrt{w\,g.}$$

expressed in feet per minute, the blade-tip velocity (v) is

$$v = 3360\sqrt{w.\,g.}$$

Now, calling the sectional area, at the foot of the chimney or the point of cutoff, A (sq. ft.); the breadth of the fan, b (ft.); expansion of casing, e (ft.); quantity of air in circulation, Q (cu ft. per min.); velocity of blade tip, v (ft. per min.); and the mine water gage, w. g. (in.); we may write as follows:

$$A = b\,e = \frac{Q}{v} = \frac{Q}{3360\sqrt{w.g.}}$$

whence,

$$e = \frac{Q}{3360\,b\sqrt{w.g.}}$$

This last formula gives the value of the expansion of the spiral casing in feet, at the point of cutoff. The expansion of the spiral must be started at a point distant from the point of cutoff equal to the distance between the two consecutive blade tips.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Miscellaneous Questions

Answered by Request

Ques.—Name the gases found in coal mines, stating which are explosive, and which nonexplosive and giving the chemical symbols of each.

Ans.—The principal gases found in coal mines are the following: Methane or marsh gas, sometimes called light carbureted hydrogen (CH_4); carbon monoxide (CO); which is the "whitedamp" of miners, carbon dioxide (CO_2), which, mixed with nitrogen, forms the chief ingredients of the blackdamp of miners. In addition to these principal gases, occur, in limited quantities, hydrogen sulphide or sulphurated hydrogen (H_2S), the stinkdamp of miners and the heavy hydrocarbon gases that are associated to a limited extent with methane; namely, ethene or ethylene (C_2H_4) belonging to the olefine group; and ethane (C_2H_6), belonging to the paraffin group.

Of the gases named, methane, olefiant gas, carbon monoxide and hydrogen sulphide form explosive mixtures with air in certain proportions. Carbon dioxide and the nitrogen of the air are the only ones that are not explosive.

Ques.—Name the instruments used in connection with coal mining.

Ans.—The instruments in common use are the anemometer, water gage, barometer, hydrometer or psychrometer, the miner's compass and tape, and the clinometer.

The anemometer is used to measure the velocity of the air current; the water gage measures the unit of ventilating pressure, each inch of water gage or water column corresponding to a pressure of 5.2 lb. per sq. ft. The barometer, either the mercurial barometer or the portable aneroyd indicates the atmospheric pressure. The hydrometer (psychrometer), consisting of a wet and a dry-bulb thermometer, is of use in calculating the hygrometric state of the atmosphere or, in other words, the percentage of moisture or the degree of saturation of the air. The miner's compass is used in putting up sights for driving entries and rooms or determining the direction or bearing of headings. The tape is used for taking measurements in the mine and the clinometer for finding the angle of inclination of the strata.

Ques.—What are safety lamps used for?

Ans.—Safety lamps are used to enable the miner to work in a gaseous atmosphere where an open light would be unsafe. In the safety light the flame is isolated from the outside atmosphere by being inclosed in a chamber called the combustion chamber of the lamp, and formed by a cylinder glass surmounted by a wire-gauze chimney. In the Davy lamp, which is much used for testing for gas, the flame is entirely surrounded by a gauze chimney. Besides affording protection to the miner while at work, safety lamps are used for testing for gas or detecting its presence in the mine air.

Ques.—How should a person who has received an electric shock be treated?

Ans.—The first consideration is to break the current or short-circuit it at a point between the generator and the victim of the accident, should he be lying helpless across the wire or held in contact with the conductor so that he cannot let go. A current can often be short-circuited by throwing a drill crowbar or other implement across the conductor on the side of the victim tward the generator. Then, by the use of a dry cleat or board, attempt to drag or push the victim from the wire. While so doing, care must be taken not to stand in a wet place or to use the bare hands in contact with the victim. In any case, no time is to be lost, but quick action must be supplemented by sending for a doctor, so as to give the victim the best treatment possible after his removal from contact with the current.

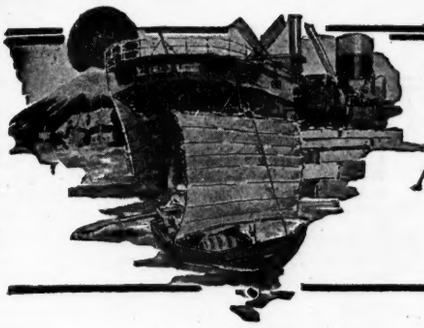
Remove the patient to fresh air if this can be done quickly. Place him on his back with a coat or roll of blankets under his shoulders, at the same time lossening the collar and clothing. See that the mouth is clear, the tongue drawn forward so as not to impede the throat passage, and proceed to revive the man by performing artificial respiration, if there are no signs of returning consciousness.

In the giving of artificial respiration, many will prefer the Schaefer method in which the patient is turned over on his stomach with arms extended and the head turned slightly to one side so as to free the mouth and permit easy breathing. The operator then kneels astraddle of the patient and placing his outstretched hands over the man's back and lower ribs(alternately throws himself forward and back, at the rate of 12 to 15 times a minute, in imitation of the rate of breathing. This must be continued without intermission until there are signs of life. Hope must not be abandoned for one or two hours, or until absolutely certain that life is extinct.

Ques.—A "foot-branch" 16 ft. wide and 350 ft. long is timbered with collars 14 in. in diameter, set at 2-ft. centers. The roof is badly broken above, causing a great deal of weight to rest on the timbers, some of which are badly decayed. We wish to replace these with new ones of the same size. Describe in detail how you would direct such work to be done at the least expense, yet insuring the safety of the workmen.

Ans.—If 14-in. collars are set 2 ft. apart, center to center, the space between the collars is $2 \times 12 - 14 = 10$ in. In order to prevent an undue fall of roof, it is necessary to place a new set of timbers between the old ones before removing one of these old sets. To do this it will be necessary to first wedge apart the two old sets so as to permit a new collar to be placed between them.

To make the work continuous, the movement in wedging should be confined to the rear set of timbers only, and, to accomplish this, 10-in. blocks must be inserted between the first two or three sets in advance, so as to prevent their movement. The old set in the rear being now wedged back 4 in. gives room for a 14-ft. collar to be placed in position. This done and the new set being completed, the next old set in advance is carefully removed to prevent an undue fall of loose material. There is now an open space of 24 in. between the new set and the next old set; and another new set of timbers can be placed before removing the second old set. In this manner the work can be continued till all the old sets have been replaced by new ones.



FOREIGN MARKETS AND EXPORT NEWS

Review of European Coal Situation

Considerable American coal is now being received in Southern Europe. The regions affected by the war are slowly recovering while Germany is supplying France according to the terms of the Peace Treaty.

ITALY

Large amounts of American Coal are arriving in Italy according to a report of the Department of Commerce, dated Dec. 19, 1919 which reads as follows:

In recent months a great change has taken place in the relative position of the United States as a supplier of coal to Italy. During the month of October it is estimated that shipments of American coal to Italy will exceed 400,000 tons, while receipts from Great Britain will be in the neighborhood of 300,000 tons. The Italian Government has made contracts in the United States aggregating about 2,000,000 tons, and it is hoped that it may be possible to increase the total shipments of American coal both for Government and private account to 500,000 tons per month. This amount would be almost equally divided between the Government, whose importations of coal are practically all intended for use on the state railways, and private shipments for industrial use.

Italy's dependance on the United States for coal has been the result of necessity. Shipments from England have been seriously interfered with by labor conditions, so that instead of increasing the quantity supplied to Italy there has been a reduction, and there is an uncertainty as to the future. Belgium has been unable to furnish the 50,000 tons of coal monthly which it had agreed to supply, so that shipments from this source have been negligible. France is in no position to export coal, and receipts from Poland and Germany are too small to deserve serious consideration. Switzerland has agreed to accept German coal destined to Italy, permitting Italy to make use of a corresponding quantity of American coal destined to Switzerland, but as matters stand the quantity involved makes this arrangement of no special importance.

Of course, the strike has upset these calculations, for foreign shipments have been suspended since Nov. 1, and under the most favorable conditions it will probably be several months before the volume of exports is back where it was in October.

In October vessels carrying 423,000 tons of coal cleared for Italy from American ports. In October, 1918, there were no coal shipments from this country to Italy, and the exports to Italy during the entire year amounted to less than 10,000 tons. Exports to that country in other recent years were as follows: 1917, 560,000 tons; 1916, 1,735,000 tons; 1915, 2,931,000 tons.

POLAND

Poland and its annexed territories are stated to require 13,000,000 tons of coal yearly, whereas the output, including that part of the Teschen district which is under Polish administration, is at the rate of only 5,500,000 tons per annum. Efforts are being made by the Government to obtain supplies from Upper Silesia (600,000 tons per month), but the output there has reached only 40 per cent. of its normal figure. In the Teschen district the production is now estimated at 75 per cent. of the last pre-war month, but political and transport difficulties hinder free supplies from either quarter. Transport difficulties are being largely surmounted and the coal shortage prevailing in Poland is attributed to general causes affecting the whole European Continent.

The introduction of the 8-hour day, incessant strikes, etc., have caused a reduction of 40 per cent in the production of the Dembrowa and Krakow mines. The July requirements for the whole of new Poand, for example, are given as 1,080,000 tons, whereas the production from all sources amounted to 445,000 tons, or 44 per cent. only of the demand, the contribution of the several districts to the total being as follows: Dombrowa, 288,000 tons; Krakow, 89,000 tons; and Karwin, 58,000 tons. Even under the best possible conditions the Dombrowa and Krakow mines can not cover the demand. though there is no doubt that the output can be increased, and the Polish Government has sent a special commission to these areas to investigate the possibilities of such increase.

PORTUGAL

Owing to the small margin of coal available, the shipments of British coals to Portugal have been cut down to a very sharp extent, and that country consequently has had to utilize wood fuel to a large extent and to lean upon the United States for supplies of coal. In normal times the imports of coal into Portugal totalled over a million and a quarter tons per annum, about half of which was utilized for the bunkering of ships. This country previous to the war supplied almost the total coal imports into Portugal, South Wales doing most of the trade. The scarcity of coal has led to importers seeking supplies of American coal. This coal has given considerable satisfaction, 43,000 tons being imported in 1916 and 35,000 tons in 1917. It is understood that efforts are being made to impart larger quantities of American coals this year, but the difficulty lies in respect of suitable tonnage. The coal deposits of Portugal have been worked to a larger extent, but the seams are thin and the coal is not adapted for steam raising purposes. The supplies of British coals sent to Portugal during the war period were made possible as the result of the authorities allocating supplies. The total, however, was insufficient for the needs of the country which suffered to a great extent from coal scarcity and higher prices.

RUSSIA

The situation in the Donets coal fields, though difficult, is improving daily. The difficulty is one of transportation, the existing means of which are insufficient to handle the output, which averages about 484,000 tons. Under Bolshevik management the production dropped to 161,000 tons, while the monthly output in normal times previously was 2,420,000 tons. Despite reports to the contrary, the pits are in good order and very few remain flooded.

There is a shortage of labor because for a long time this region formed part of the front. Inducements are being offered miners and there is now a reassuring influx of labor. There is a shortage of horses, which were all driven away during the fighting and the Bolshevik occupation. The Government is cooperating with the mine owners by sending a large supply of horses. Financiers are giving credit freely to all in the restoration of the mines.

ENGLAND

Coal arrivals at Hull from the various collieries by river and rail totaled 124,257 tons for the month of September 1919, according to a report dated Dec. 8 from the Dept. of Commerce, as compared with 220,774 tons in 1918, a decrease of 96,517 tons. The total arrivals for the nine months ended Sept. 30, 1919, reached 1,492,858 tons against 2,021,245 tons for the corresponding period of 1918, and 5,833,232 tons in 1913. Because of the embargo on shipments abroad there was only one cargo in Sept., 1919, consisting of 708 tons to France and the total foreign exports for the nine months only amount to 186,232 tons. The decreased arrivals are explained by the strikes and labor troubles. While supplies are still short, bunker coals are available and ships are not obliged to proceed to other ports to bunker as was recently the case.

BELGIUM

Although the rate of output of coal has now reached 98 per cent. of the pre-war rate in Belgium, the fuel shortage is becoming very serious. It is said there are over 200,000 tons waiting in the Borinage and about 700,000 tons in the Charleroi district for empty trucks. The shortage of house fuel, as explained in a previous report, is principally due to the fact that the mines are obliged to burn domestic fuel, not being able to obtain the usual supplies to mix with their own smalls.

To counteract the reduction in the output due to the shorter working day, coal owners are now considering the question of introducing labor-saving appliances into the mines on a more extensive scale, is a report from the Iron and Coal Trades Review of a recent issue.

HOLLAND

According to the annual report of the State mines in Limburg the coal produced in 1918 in the various mines (as compared with 1917 in brackets) amounted to: In the Wilhelmina mine, 562,228 tons (488,632 tons); in the Emma mine, 661,031 tons (557,237 tons); in the Hendrik mine, 179,013 tons (46,459 tons). Including the remainder of the previous year the total available stock was 1,409,424 tons, of which 1,377,149 tons were supplied to the Government Coal Distribution Office.

The average price of coal was 20.27 florins per ton, as against 15.32 florins in 1917, 12.20 florins in 1916, and 9.41 florins in 1915 (12 florins to the £ at par). A net profit of 2,000,000 florins acrued to the Dutch Government.

GERMANY

According to a reporter in the Iron and Coal Trades Review of Dec. 12 the provisional return shows that the production of coal in the Ruhr in November amounted to 6,100,000 tons, as compared with 6,200,000 in the corresponding month in 1918, and 6,940,000 tons in October of this year. The reduction, however, was solely due to there being fewer working days in November than in October; the daily output averaged 260,000 tons and 257,000 tons in the two months respectively.

It is announced from Berlin that 3000 trucks of coal are being sent to France every day, corresponding to about 900,000 tons of coal per month.

Brazil's Coal Imports during September

The consulate general reports from Rio de Janeiro that during September coal imports into Brazil totaled 9,294 metric tons, of which 5,388 tons were British coal and 3,906 tons American coal. In September, 1918, all the coal imported, 16,032 tons, came from the United States, and in the corresponding month of 1917 of the 25,365 tons imported 19,364 tons were American coal and the remainder British.

Coal in Chile

Bituminous coal is the chief coal imported into Chile and one of the largest industries using this is the nitrate. The temporary inactivity of the nitrate plants has reduced the demand for coal to a minimum. However, a good market may be expected in the future. United States coal is held in high esteem and some importers of coal who were compelled to close their business during the war are planning for trips to the United States or Australia for the purpose of renewing their connections.

Prior to the war, Great Britain and Australia were the largest exporters of coal to Chile, but since 1914 the United States has taken their place. It should be observed, however, coal has again begun to arrive from Australia, and if the United States is to maintain the lead it will require effort on the part of her exporters.

In the nitrate plants, the Pocahontas Valley coal is the one mostly used and very often this is mixed with the Australian coal. For domestic purposes, in the nitrate regions the Australian coal is used without mixing. Of course, the quantity consumed for domestic purposes will be very small.

The question as to who will supply the coal to Chile in the future will probably be decided by the freight rates. In ordinary times, it is a common practice to send coal to Chile as ballast on ships that are to carry nitrate back with them.

The native coal in Chile serves a number of purposes, but it is not as valuable as the imported coal for the reason that it possesses a very rapid combustion quality. The following shows the native production for Chile:

Year	No. Mines	Production in Net Tons
1912	18	1,194,808
1913	17	1,119,081
1914	17	944,829
1915	17	1,050,874
1916	15	1,202,252

The following shows the importation and exportation of coal for a period of five years:

Year	Importation (Tons)	Exportation
1912	1,577,221	263,072
1913	1,587,084	286,536
1914	1,304,470	266,972
1915	461,468	184,962
1916	519,884	173,695

Table showing the importation of coal into Chile for thet year 1917, which are the latest figures available:

Country	Weight	Value
Great Britain	72,306	1,338,222
Germany	484	17,000
United States	288,424	5,000,618
Peru	10	550
Australia	45,443	1,113,613
Total	406,667	7,476,003

Table showing the importation of coke for 1917:

Great Britain	25,480	780,925
United States	72,696	2,188,812
Australia	21	492
Total	98,197	2,97029

Table showing the exportation of coal from Chile for the year 1917:

Bolivia	9,200	1,012
Argentina	88,980	8,994
Total	98,180	10,006

N.B. All the weights herein given are expressed in kilos and the value is given in $ per 18 d., i.e. Chilean dollars—(A Chilean dollar is worth about 35 cents in United States Currency.

Both coal and coke are admitted free of duty in Chile.

Efforts to Increase Coal Production

The Government is now doing all in its power to increase the production of the mines, and its efforts have been successful to a large extent, thanks to the cooperation of the laborers and to the inauguration of a more intensive system of exploitation, employing three instead of two shifts of workmen. It is encouraging to note that, owing to these measures, the mines of the Dombrowa coal basin are now producing fully 75 per cent of their pre-war output.

Furthermore, efforts are being made to impress upon coal consumers the necessity of saving that fuel as far as possible by the substitution of wood peat, and other combustibles, which till recently have been little used. It is stated that the reserve supply of wood in Poland could repace 600,000 tons of coal, but the present difficulties in railway transportation make delivery impossible. In addition, there is lignite, of which not more than 15,000 tons per month is mined in Poland. The local production of peat and other substitutes for coal is also small

Foreign Freight Rates

The Shipping Board rates, as of Dec. 22, 1919, by steam, are as follows:

Port	Rate	Tons of Displacement
Genoa-Leghorn	$26.50	1000
Spezia-Saxona	26.50	1000
Piraeus	28.50	1000
Trieste-Venice	31.00	800
Algiers	26.00	800
Cadiz-Bilbao	23.50	1000
Barcelona	26.00	1000
Antwerp-Rotterdam	22.50	1000
Lisbon	22.50	1000
Gothenburg	24.00	1000
Marseilles	26.00	1000
Stockholm	26.00	800
Hamburg	23.00	1000
Rouen	23.00	1000
Malmo	25.00	800
Pernambuco	16.00	500
Bahia	16.00	500
Rio	17.00	1000
Santos	18.00	600
Rio Grande do Sul	19.50	500
Buenos Aires or	16.00	1000
La Plata or	OR	
Montevideo	17.00	750
Rosario	19.00	750
Bahia Blanca	17.50	1000
To Nitrate Range	14.00	....
Havana	7.50	600
Cardenas or Sagua	9.00	300
Cienfuegos	9.00	500
Caibarien	9.50	300
Guantanamo	9.50	500
	9.00	400
Manzanillo	9.50	300
Bermuda	9.00	300
Bermuda p.c. and dis. free		
Kingston	9.50	400
St. Thomas	10.00	500
St. Lucia	11.00	500
Barbados	11.00	500
Santiago	8.50	500
	9.00	400
Port of Spain, Trin	11.00	500
Curacao	10.50	500
Free p.c. Curacao		
Demerara	13.00	400

All above rates gross from charter.

Production by Fields

Statistics of production published by the Geological Survey have hitherto been given by states and counties, a grouping which, although capable of exact definition, is often less significant than the producing districts recognized by the industry. The following table apportions the 1917 and 1918 output by producing fields.

It is recognized that some of the districts shown, such as Illinois and Central Pennsylvania, may be further subdivided. The grouping, however, conforms to trade usage and is practically that established by the Fuel Administration.

PRODUCTION OF BITUMINOUS COAL IN THE UNITED STATES BY DISTRICTS, IN 1917 AND 1918.*

District	1917	1918
Central Penn.	59,044,000	61,629,000
Northern Penn.	7,381,000	8,051,000
Pittsburgh, Penn. & Panhandle of West Virginia	50,588,000	51,554,00
Westmoreland, Latrobe, Greensburg, and Ligonier	16,879,000	17,701,000
Connellsville	34,597,000	35,677,000
Somerset and Cumberland-Piedmont	13,843,000	14,267,000
Fairmont, West Virginia	17,568,000	20,104,000
Northern Ohio	26,849,000	30,287,000
Michigan	1,375,000	1,465,000
Southern Ohio	14,098,000	15,768,000
Northeastern Kentucky	6,454,000	7,109,000
Hazard, Kentucky	1,885,000	2,364,000
Kanawha and Kenova-Thacker	27,864,000	30,655,000
New River, W. Va.	15,096,000	14,448,000
Pocahontas and Tug River	24,947,000	23,128,000
Southwestern Virginia	8,604,000	9,041,000
Southeastern Kentucky	6,381,000	8,083,000
Tennessee and Georgia	6,313,000	6,898,000
Alabama	20,068,000	19,185,000
Western Kentucky	10,249,000	10,833,000
Indiana	26,539,000	30,679,000
Illinois	86,199,00	89,291,000
Iowa	8,966,000	8,192,000
Missouri	5,671,000	5,668,000
Kansas	7,185,000	7,562,000
Arkansas	2,144,000	2,227,000
Oklahoma	4,387,000	4,813,000
Texas	2,356,000	2,261,000
North Dakota	791,000	720,000
Montana and Northern Wyoming	7,029,000	7,606,000
Colorado	12,483,000	12,408,000
Utah and Southern Wyoming	9,899,000	11,502,000
New Mexico	4,001,000	4,023,000
Washington	4,010,000	4,082,000
	551,693,000	579,281,000

*Does not include production in Alaska, California, Idaho, North Carolina, Oregon and South Dakota.

Newfoundland Needs Coal

According to a report of the Department of Commerce of Dec. 23, the Government of Newfoundland has deemed it expedient to formulate regulations respecting the sale coal, which have been approved by the Governor in Council.

There is at present in St. John's approximately 2000 tons, or 4000 tons below normal, of anthracite coal, retailing at $28 per ton, and 7000 tons, or 20,000 tons below normal, of bituminous coal, retailing at $15 and $17 per ton. These prices, considering the long, cold winters, are rather hard on those of moderate means, and it is claimed by one of the prominent St. John's dealers if the United States and Canada do not come to the relief of the coal merchants soon there will be more or less suffering among the population.

Canadian Coal Settlements

"On Dec. 23, C. A. Magrath, Fuel Controller, met a few of those interested in the importation of bituminous coal in conference at Ottawa. The shippers and wholesalers of the provinces of Ontario and Quebec were represented, as were the Canadian Manufacturers' Association, the Grand Trunk Railway and the Canadian Trade Commission. The object of the conference was to decide on the best method to adopt in settling for the emergency coal. The meeting unanimously approved Mr. Magrath's ruling, which was that this coal must be invoiced to the Canadian Trade Commission by the United States shippers at prices in accordance with the United States Fuel Administration rulings.

World's Production of Coal

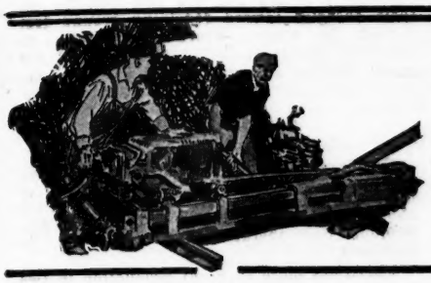
Comparisons of the production, price movements, currency expansion, and war debts of the principal countries of the world between the five years 1910-14 and the present year have been issued as a White Paper.

The output of coal as compared with United Kingdom, United States of America, France, Belgium, Netherlands. and Germany follows:

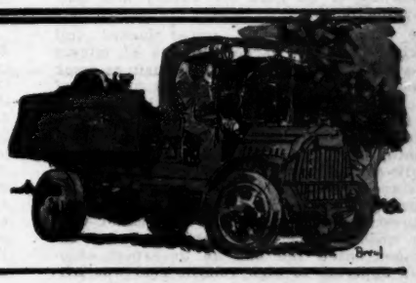
Monthly average.	Tons	Proportionate figures.
1913	87,270.000	100
1918	86,903.000	99.6
1919 (1st half)	70,326.000	80.6
1919 (2nd quarter)	69,327.000	79.4

Siberian Coal for Manchuria

In order to relieve the fuel crisis in the Far East and in consideration of the foreign exchange, the Osotop (fuel conference) has proposed a shipment of the Tchercmukhovsky and Transbaikal coal to Manchuria says a report which was translated in the Russian Division, Bureau of Foreign and Domestic Commerce from Russian Economist, Vladivostok, for July 21, 1919.



COAL AND COKE NEWS



Wilkes-Barre, Penn.

Lehigh Valley Coal Co. officials meet to discuss ways to Americanize mine workers. Plan to combat Bolshevism. Vice President F. M. Chase, General Counsel F. W. Wheaton and Mining Superintendent Thomas Thomas among the speakers at the conference. Many of the miners cannot speak English. Must be taught to appreciate the U. S Government and the country's institutions.

The second of a series of social meetings of the staff and field officers of the Lehigh Valley Coal Co. was held in Hotel Redington, Wilkes-Barre, recently; 250 men, including clerks, foremen, assistant foremen and superintendents of four divisions, Luzerne, Lackawanna, Wyoming and Susquehanna, as well as the official staff, attending. The purpose of these meetings is to talk over the means of improving the relationship between the company and the rank and file of its 19,000 employees.

One of the main topics that was discussed at this meeting was the rising tide of Bolshevism in many parts of the country—to determine how far it has reached the anthracite regions, if it has reached it at all, and how to help stem it.

F. M. Chase (vice president and general manager of the Lehigh Valley Coal Co., presided, and Judge F. W. Wheaton of the company (general counsel), introduced the speakers.

Speaking of Bolshevism, Mr. Chase said: "There are signs of unrest and I think Bolshevism has not reached us here yet. But with your help we must try to keep it out. We must not let it rear its head. One of the best ways to accomplish this end is not to let it in at all.

"Among our 19,000 employees," continued Mr. Chase, "I know there are few if any Bolshevists. We must prevent the others from becoming converted to these dangerous doctrines. Not only must we help them as employees of the company, but as American citizens. We must give them fair and honest treatment and not take advantage of them in any way.

Many of the men come to us from overseas, where they had hard taskmasters, and so they are used to becoming suspicious against authority. They are being told by men who have no love for this country of the evils wrought on them, of the wrong, imaginary as it is, that is being done to them by capitalists. They hear such reports from their fellow workmen and read them sometimes in the foreign-language papers. Very little has been done and is being done to combat these false and dangerous doctrines.

"Tell them that the evils the demogogs talk to them about do not exist. Convince them that this form of government is better than the Soviet form. Help them appreciate the United States and its institutions. Tell them that it is the greatest country in the world. Try to convince them it is better for them to be good, law-abiding citizens than to be creatures who try to overthrow the world and turn it upside down."

Following Mr. Chase, Judge F. W. Wheaton pointed out the democracy of America and the opportunities that are offered here to all, by taking his own life as an example. He said that he was born of comparatively poor parents and succeeded to the point that he has, only through his own initiative and energy. His opportunities were those of the agerage, he said. His career exemplified that of Mr. Chase and of other officials of the company, he asserted.

He contrasted this democracy with what the Bolshevists want to bring about. He said, "The object of the Bolshevists is to turn upside down this government which has existed so long, the greatest government of all time. They abandon all belief in the sanctity of the home. They want no family. They are atheists. They want to destroy Christianity and all the morality which goes with Christianity. When the people get aroused to the purpose of these Bolshevists they are going to hold fast to the laws and to the administration under those laws."

He declared that one of the reasons for the present social unrest was due to malicious propaganda, which is being spread through the country's industries, he said. It was incumbent then upon the company's officers, such as foremen, assistant foremen who come into daily contact with the men to help combat its further progress.

Among the other speakers were Thomas Thomas, mining superintenaent; Dr. S. P. Mengel, head of the compensation department, and Frank L. Scott, purchasing agent, all of whom gave interesting talks.

Fairmont, W. Va.

Car shortage decreases production more than celebration of Christmas during holiday week. In Fairmont region, 110 mines shut down. Most of the coal goes to Ohio and Michigan. Future production expected to be restricted owing to car shortage and other causes.

A sharp shrinkage in production featured the Christmas week in northern West Virginia, as might naturally have been expected under all circumstances and in view of the holiday season; but what contributed to the decrease in tonnage, to an even greater extent than a celebration of the holiday, was a car shortage existing throughout most of the week. Early in that period there was a most pronounced shortage, Monday being the exception owing to a Sunday accumulation. However, by Christmas eve cars were so scarce that no attempt was made, to any appreciable extent, to produce coal, there being 110 mines alone, on the Monongah division of the Baltimore & Ohio, in the Fairmont region, shut down owing to the car shortage, the same conditions prevailing throughout the entire northern part of the state.

Of course production was at a standstill on Christmas day. There were possibly 30 per cent. of the miners at work, on an average, the day following Christmas when cars were somewhat more plentiful, the railroads having had an opportunity to catch up. There was a still better supply available on Saturday the twenty-seventh, but even then a good many mines were without cars.

As a result of the conditions described, there was a loss of fully one-third in the output of northern West Virginia regions, the total output in the Fairmont region being 4470 cars, or about 222,450 tons. While the number of cars on hand on the twenty-ninth was sufficient for that day's loading, nevertheless the supply of empties was below the usual Monday quota. By a perversity of fate or some peculiar circumstances, cars always appear to be plentiful when there is a shortage of men, because of a holiday or for other reasons, as was the case during the latter part of the holiday week.

The prospects were for a continuance of the shortage in the Fairmont region and in other northern West Virginia fields. During the holiday period the ratio of eastern to western shipments was about five to one most of the coal westward bound being for points in Ohio and Michigan. There was a decided decline, during the period referred to, in the tonnage of railroad fuel shipped, it being fully 50 per cent. less than during the week ending the twentieth.

While railroads appeared to be showing a disposition to settle for coal diverted and confiscated, judging from the receipt of certain forms, yet up until Dec. 27, the returns for coal taken over during the strike had been embarrassingly small, but producers were still living in hope.

Upon the threshhold of a new year, northern West Virginia operators were none too optimistic as to the immediate future, being inclined to believe that, owing to a car shortage and other causes, production would be more or less restricted.

Charleston, W. Va.

Car shortage further decreases limited production of Christmas week. Prolonged poor transportation certain. High-volatile coal went West until Dec. 27. Then embargo is lifted and Kanawha coal goes to tide for export. Large number of New River mines shut down due to acute car shortage. Little relief by railroads in payment for coal confiscated and diverted.

Production in this territory was on the downgrade throughout the holiday week, a general cessation of work during the last three days of the week, of course, being in part responsible for the limited production, but the loss was fully as great from a car shortage alone. While there was a fairly adequate supply available at the outset of Christmas week by Wednesday, Dec. 24, there were only about 800 cars available for this portion of West Virginia and northeast Kentucky as against a normal supply of about 3200 cars.

Even after Christmas day, when the small number of men at work makes it unnecessary to have a large supply, there was not more than a 50 per cent. supply, and by Saturday the situation, from a transportation standpoint, had grown worse instead of better. There appears to be no certain relief in sight, although railroad officials hold out hopes of an improvement by Jan. 15. As to any such prediction, operators, generally speaking are skeptical. Some of the more pessimistically inclined operators even go so far as to predict that the car supply will be far from adequate for the next six months. Even those not so pessimistic regard a prolonged car shortage as certain.

While operators in this area had begun to receive compensation for coal appropriated by the railroads during the strike, such returns were still rather meagre and shippers were beginning to wonder just when the railroads would begin to settle in adequate amounts for coal taken, especially in view of published reports of what was being done to relieve the situation.

While, of course, there was a decided demand for coal from this section of the state, coal men said the demand was not particularly brisk, or in other words that buyers were not in particular haste to secure coal. An effort was being made by producers of both high-volatile and smokeless coal to make up the deficit in contract shipments, due to the strike, however, little progress was made in that direction owing to the car shortage and the cessation of work during the last three days of the week. Practically all of the high volatile coal had been forced into the West up until Saturday the twenty-seventh, when the embargo as to tidewater shipments was lifted, coal beginning to flow once again to the coast.

Loadings were limited in the Kanawha field throughout practically the entire holiday week, owing to a car shortage and to the Christmas let up in operations. Cars were about as scarce as they have been at any time during the present calendar year, the scarcity becoming most acute in the Kanawha region on the day before Christmas, when as a sample, there were only 244 cars in the entire Kanawha section, forcing many mines to shut down before the general Christmas-eve suspension. Even the general

Christmas suspension resulted in the accumulation of no cars for Friday and Saturday loadings.

Of coarse nearly all mines lacked full working forces as large numbers of miners were making the last half of Christmas week a vacation; but, even with a less number of cars needed, the supply was short, there being not over a 60 per cent. car supply on Friday, Dec. 26. On Saturday, the twenty-seventh, there was only about a 40 per cent. supply available. Of course under such circumstances little headway had been made in regaining ground lost during the strike and producers were consequently far behind with their orders. Operators were somewhat encouraged when the ban as to export shipments applying to high volatile coal was lifted on the twenty-seventh, owing to the fact that export coal brings a better price than is being received for coal shipped to domestic markets.

New River fared little better than the Kanawha region in point of cars furnished during the week ended Dec. 27. On Wednesday, Dec. 24, the day before Christmas, the supply had fallen as low as 113 cars, and on Friday the supply was equally poor, although it made less difference then, owing to the fact that miners were not working in large numbers. As a result of the acute car shortage, there were a large number of mines shut down in the New River field during the week, so that it became impossible to overcome a part of the tonnage loss sustained during the strike, and shippers were, therefore, falling behind with their orders. Despite repeated promises no relief, to amount to anything, has been afforded by the railroads through the payment for coal confiscated and diverted during the period of the strike emergency. While frequent metings have been held by operators of the New River field, no change has been made as to the "check-off" and the contract of Sept. 1 still stands as abrogated. This has made no appreciable difference, however, in production in the New River region.

Bluefield, W. Va.

Production about one-third of normal in Pocahontas field during Christmas week. Car shortage and lack of miners limit output. Railroad motive power also inadequate. Ban on exports removed, smokeless goes to tide. Tug River field at a standstill for almost a week; labor and car shortage the cause.

While, of course, it was not to be expected that the production of coal would be maintained in the Pocahontas and adjoining regions during Christmas week, yet the output fell far below general expectations during the holiday period as much from car shortage as from a cessation of work on the part of the miners. There was a general relaxation of work throughout the southern part of the West Virginia mining fields, especially during the latter part of the week; but that would not account for the large loss in the output sustained, it being estimated that operations were limited to about two full days, so that production was only about one-third of normal. In fact little loading was done in the southern West Virginia regions between the twenty-fourth and the twenty-ninth of December. The car supply began to run short at the very outset of the week, interfering with plans to produce as much coal as possible before Christmas eve. In addition to the shortage of cars, inadequate railroad motive power so blocked sidings that it was impossible to place empties or move loads.

Miners at various points in the southern part of the state began to desert the mines even as early as Dec. 13, there being a further exodus on Saturday, Nov. 20. The day after Christmas an attempt was made to operate mines, but the number of men it was possible to command was so small that the speak of was mined on the twenty-sixth or the twenty-seventh. It was not until about Jan. 1, in fact, that miners were reporting for work in sufficient numbers to restore production to noraml.

While no coal was being moved eastward during Christmas week for export, yet at the beginning of the following week, the ban on export business was removed, and smokeless producers began, under certain restrictions, to ship coal to tidewater for overseas shipment. Operators throughout the southern part of the state welcome the opportunity to resume export shipments, owing to the better price it is possible to obtain for export coal; the prices fixed on domestic shipments being such as to make it impossible for operators to quite meet their costs.

Only 669 cars were loaded in the Tug River field during the week ending the twenty-seventh, that representing a production of about 33,450 net tons, or little more than one-third of the amount of coal produced during the strike. Between the twenty-fourth and the twenty-ninth of December, production in the Tug River region was virtually at a standstill. While it is true that a part of the loss was attributable to the absence of so many mine workers, yet an even larger source of loss was the extreme car shortage. Still another handicap was the inability of the Norfolk & Western to move loads promptly through insufficient railway motive power. Full cars blocked loading at a number of operations during a part of the week. On Friday, Dec. 26, only 33 cars of coal were loaded in the entire Tug River field, 72 cars being loaded on the twenty-seventh.

Even the lull in operations during Christmas week failed to bring relief form a car supply standpoint, for empties furnished on the twenty-ninth were sufficient only for a 50 per cent. loading. Notice was received in the Tug River field just before the close of the year, that it was permissible to ship coal for export under certain conditions. Coming at the time it did,, the order permitting export shipments was gladly received because of the better price commanded by coal for export. There is still a large amount of money due Tug River operators for diverted and confiscated coal, it is stated.

A quite limited tonnage was produced in the Pocahontas region during the final full week of the year, owing to the fact that mining activities wer confined to about two days of the week. In the first place even with a reduced number of men at work the car supply was entirely inadequate, a number of mines finding it necessary to shut down even before Christmas. Of course in the two remaining days of the week following Christmas, there were many absentees and it was, therefore, impossible to secure any production either on the twenty-sixth or twenty-seventh, although on the North Fork and at one or two other places an attempt was made to start, but was given up when only five and six men at a time put in an appearance. As a matter of fact there was a shortage of miners until the first of the year.

Huntington, W. Va.

Logan output 50 per cent. of capacity during Christmas week due to acute car shortage. Labor shortage less troublesome. Further production losses predicted due to poor transportation.

Little more than half the capacity output of the Logan field was mined during Christmas week, but the holidays were not so much to blame for the greatly decreased production as was a quite acute car shortage lasting throughout virtually the entire week The shortage cut into production to the extent of nearly 26 per cent., causing a loss of 67.139 tons; on the other hand, the labor shortage, which covers an observance of the Christmas holidays, entailed a loss of only a little more than 16 per cent or 42.601 tons. The total production loss was 124,-000 tons, being almost equal to the output for the week of 138,000 tons.

When the car supply was sufficient and other conditions were favorable, and in fact up until Dec. 15, the Guyan field was producing coal at the rate of 240,000 and 250,000 tons a week. However, the production for Christmas week of 1919 was nearly 70,000 tons in excess of that of the same period of 1918; the lack of demand being responsible for the loss of the earlier year.

At no time during the holiday week were mines able to secure a full supply of cars, and, in a number of instances, producers gave up trying to get out any coal, closing down their mines for the holidays. At the outset of the following week, cars were plentiful, it being stated that there were enough cars on hand at the beginning of the week to last for three days; but when that supply was exhausted, it was predicted there would be further production losses from car shortage.

For the first time in about two months, Logan coal began to flow eastward in small quantities about the twenty-seventh, when the embargo against eastern shipments was removed. Most of the eastbound gas coal and splint was consigned to tidemwater.

Owing to the large tonnage of Logan fuel diverted during November and a part of December, Logan producers were behind with customer's orders and are now bending all their energies toward regaining ground lost during the strike. There is naturally an excellent market at the present time for the Logan product.

Ashland, Ky.

Northeast Kentucky production cut in two Christmas week. Labor largest source of loss; car shortage next. Output for 1919 about ten per cent. under 1918. Still $1,-000,000 due operators for coal taken by railroads.

Christmas more than cut production in two in the northeast Kentucky region, the output during the period ending the twenty-seventh amounting to only 77,620 tons or about 45 per cent. of previous weeks. In fact during the period ended the twentieth, the output was right aroun1 160,000 tons. Full time production for the five working days of Christmas week should have reached 168,000 tons. The largest source of loss, of course, was from labor, amounting to 47,500 tons or about 28 per cent. Still the car shortage loss was not much below the above figures. It cost the production of 33,000 tons or 22 per cent.

As nearly as can be stimated, the production for the year in the northeast Kentucky fields was 6,000,000 tons or only about ten per cent. under the 1918 production. When it is taken into consideration that during the first five or six months of 1919, there was virtually no market at all, and that during the latter part of the year, a strike curtailed production, the 1919 output is regarded as being extremely satisfactory.

While payments for coal diverted and confiscated are somewhat more liberal than has previously been the case, there is still outstanding about $1,000,000 due operators for fuel taken by the railroads or else sent to others than original consignees.

There was a somewhat better supply of cars available on Dec. 29, and in fact right up until the end of the year when the supply began to dwindle again.

Topeka, Kan.

Members of Kansas Legislature considering state law to settle industrial disputes. Governor Allen interested. Administration program to include three dominant policies. Recent coal strike may develop an industrial court. Profiteers to be prosecuted. A new Workmen's Compensation law considered of vital importance.

Preparatory to the meeting of the Kansas legislature in special session on Jan. 5, members of that body have under consideration numerous plans for a state law which will meet the requirements of the present industrial situation, brought to an acute head by the recent coal strike. Governor Henry J. Allen, in his proclamation calling the special session, has asked the legislature to formulate some method whereby disputes between employer and employes (in essential industries) may be settled without a complete curtailment of production caused by strike or lockout, pending a settlement of the dispute. Arbitration of these disputes, Governor Allen declared, has proved inadequate. Some other plan, in the operation of which neither party of the dispute shall have a final voice, must be devised, he stated.

The administration legislative program as proposed will include three dominant policies. First, an indusrial court will be urged, it is said, with a possibility that the legislature may undertake the establishing of such an institution itself, and also recommend such as a solution of the current problem on a national basis. Profiteering laws will be second. Recourse by the public may be secured through a bill providing for a jury determination of profits. Another course in this particular may be through a commission or license system to retailers and affecting tradesmen, middlemen and producers. A third provision considered of vital importance is for a new workmen's compensation law. A commission was appointed by the governor, at the request of the last legislature, which met the first part of this year, to investigate the operation of the present workmen's compensation law and to report recommendations for its revision or a new law.—The World, Tulsa, Okla.

Birmingham, Ala.

Interesting byproduct coke oven development in Alabama. Two iron making concerns step in at the Ensley byproduct plant as the Tennessee company retires. Four additional Alabama furnace companies using byproduct coke. Two other iron concerns building new plants.

There was more or less speculation as to what would become of the Semet-Solvay byproduct plant at Ensley when the Tennessee Coal, Iron and Ry. Co. recently blew in its additional complement of byproduct ovens, became independent of the Semet-Solvay coke supply and, therefore, decided not to renew the contract which expired Jan. 1, according to the Birmingham Ledger.

Continuing this paper says: "There need have been no speculation except as to who would use this plant. Two ironmaking concerns have already arranged to take over what the Tennessee company does not need. They will furnish the coal, just as the Tennessee company did, and they will also take the coke for furnace operation. The Semet-Solvay will continue to convert and market the coal-tar byproducts.

"The outcome of this change of service will be one of greater benefit to the district. Two more iron makers will operate on the economic output of the byproduct oven instead of the wasteful output of the pen beehive oven. Already we had four Alabama furnace companies making and using the byproduct coke, namely the Central Coal and Iron, the Tennessee, the Woodward and the Gulf States Steel. With two more getting the supply of the Semet-Solvay, and the and Sloss-Sheffield and the Birmingham Coke and Byproducts building new plants, soon there will be not as much waste of our coal, but, on the contrary, an additional economy in our iron production, and added wealth in the coal tar derivatives.

Thus are we effectively meeting the competition of other iron making centers that would otherwise put us out of business.

PENNSYLVANIA

Anthracite

Pottsville—The Pine Hill Coal Co., of Minersville, near this place, is putting down 12-in. bore holes on its property, by means of which this company hopes to combat a fire in its mine workings.

Hazleton—The G. B. Markle Co., with operating headquarters at Jeddo, north of this place, is negotiating with the Union Improvement Co., of Philadelphia, Pa., for a renewal or extension of a lease covering the mineral rights on the coal land, on which are Jeddo No. 4, Highland No. 5 and the Ebervale collieries. Some 1800 employees are affected by the temporary suspension of operations at these mines.

Scranton—The Langcliffe colliery of the Hudson Coal Co., at Avoca, near here, was taken over recently by the Suffolk Coal Co., composed of former Mayor E. B. Jermyn and his son, E. B. Jermyn, Jr. John Jermyn, father of E. B. Jermyn, was one of the pioneer coal mining men of the region. He was born in Suffolk, England, and the name of the company that took possession of the Langcliffe colliery is taken from the name of his birthplace. About 500 men are employed in and about the Langcliffe colliery. It was stated by E. B. Jermyn, Sr., that immediate improvements will be made to the plant and that every effort will be made to increase the daily output.

Bituminous

Hollsopple—Fire recently destroyed the mine tipple of the Flora Coal Co., located near here, in Somerset County. The tipple was formerly owned by the Salmore Coal Co., whose offices were in Johnstown; was purchased on Nov. 1 by H. H. Cassler, of this place.

Champion—Kelly Bros., of Snow Shoe, recently acquired the extensive coal mine interest of J. Fred Kurtz and P. McGinness, of Connellsville, and the Bygate estate, of Pittsburgh. The property purchased is at Champion, on the Monongahela River, in Fayette County, Pa., and the consideration was $347,000. It is said the mine when worked to its full capacity, has an output of 600 to 800 tons of coal per day.

Brownsville—It is reported that the property of the Orient Coke Co., at Orient, Fayette County, Pa., has been taken over by the Reilly-Peabody interests of Pittsburgh, Pa., who operate the American-Connellsville Coal and Coke Co., near Brownsville. The Orient plant consists of several hundred acres of unmined coal, a modern well equipped mine, 480 beehive coke ovens and a number of houses. This plant is on the Monongahela R. R., between Brownsville and Uniontown. It is a shaft mine with a steel tipple.

Brownsville.—The sale of the Orient Coke Co. plant at Orient, Fayette County, Pa., which was announced to have been made to the Reilly-Peabody interests, is now persistantly reported to have been made to the Bethlehem Steel Co. The purchase price is said to have been $3,000,000. There are between 600 and 700 acres of unmined coal in connection with the plant. Julian T. Kennedy, of Pittsburgh, Pa., is president of the Orient Coke Co., and R. M. Fry, of Uniontown, Pa., is general manager. This operation is said to be a model plant as regards equipment, and only recently a mine-rescue station was established at the works.

Waynesburg—The following transfers of Pennsylvania coal lands have taken place recently: E. D. Patterson, of this place, purchased the coal underlying two tracts of land in Morris Township, near Deer Creek, Greene County. The tracts contain 147 and 98 acres, respectively. The price paid was $175 per acre, or $42,875 for the two tracts. David C. Cumpston, of Waynesburg, recently sold to E. H. McClelland and John Mackay, of Uniontown, the undivided one-fourth of the Pittsburgh seam of coal underlying two tracts of land in Springhill Township, Greene County. T. Riley Huffman and wife, of Waynesburg, sold to the Fish Coal Co. (a W. Va. corporation) six tracts of coal land (aggregating 277 acres) in Springhill Township, in Green County. Henry G. Dalton and wife, of Brandt, Ohio, sold to the Cleveland Cliffs Coal Co. an undivided one-third interest in 41 parcels of land in Morgan and Jefferson Townships, Greene County. Robert Hobson and wife, and Frances H. Whitten and wife, all of Hamilton, Ontario, Canada, sold to the Stelco Coal Co., an undivided one-third interest in 18 parcels of coal land in Morgan and Jefferson Townships.

WEST VIRGINIA

Bluefield—The Smokeless Coal Operators Association of West Virginia has elected the following governing board for the various districts in West Virginia, it has been announced from headquarters of the Association, at Washington, D. C.: Pocahontas district, T. E. Houston, of Cincinnati, Ohio, and O. M. Deyerle, of Bluefield, W. Va. New River district, C. C. Beury, of Charleston, W. Va., and R. H. Gross, of Boston, Mass. Tug River district, George Wolfe, of Winding Gulf, W. Va., and J. T. Wilson, secretary of the Tug River Association, Bluefield, W. Va. Winding Gulf district, P. M. Snyder, Pemberton Fuel Co., Mt. Hope, and E. E. White, Glen White, W. Va. J. J. Tierney, of Philadelphia, Pa., treasurer of the National Coal Association, was elected president of the Smokeless association, succeeding T. E. Houston, who declined re-election. Other officers elected were: G. H. Caperton, first vice president; Justus Collins, second vice president; W. R. J. Zimmerman, Charleston, treasurer; E. J. McVann, secretary, Washington, D. C.

Charleston—More wagon mines are in operation at the present time in West Virginia, as far as it is possible to tell, than at any time during the present calendar year or in fact, since the armistice became effective on Nov. 11, 1918, a general shortage of coal and weather conditions being contributing factors in causing a resumption. When the 75c. a ton allowance was eliminated by the Fuel Administration, wagon mine production in West Virginia ceased to a great extent, and a large number of mines were either dismantled or fell into disuse and decay. While the shortage of coal revived wagon mine production it has, at no time since such revival, reached the proportions attained during the war, the same incentive or stimulus not existing. Even when wagon mine operations were resumed, an order against the use of open top cars tended to discourage wagon mine production; and, while that order was rescinded just before the strike, a car shortage has materlialy hampered operation of the wagon mines, such plants always being served only after tipple mines have been supplied with cars.

OHIO

Columbus—Judge Sater in the United States Court rendered a decision in the suit brought by John H. Winder, formerly president of the Sunday Creek Coal Co., against John S. Jones, principal stockholder of the company, asking for a receiver for the stock of the Sunday Creek Coal Co., and the Steadman Grocery Co., a subsidiary concern. After a lengthy hearing, in which much testimony was taken, the court held that the contention of Mr. Winder that the San Toy coal properties were purchased from the Jones & Adams Coal Co., by the Sunday Creek Coal Co., at an excessive figure was not to be considered as Mr. Winder knew of the details of the deal. A similar decision was rendered in the case of a sale of some Pomeroy coal lands to the Sunday Creek Coal Co., at $195,000. No receiver for the stock of the Steadman Grocery Co., was ordered, but the court reserved the right to name such receiver at a later date if found necessary. The application for a receiver for the stock of the Sunday Creek Coal Co. was refused, and it was held that Mr. Winder would have to wait until Mr. Jones had been repaid all of the advancements to the company before a division of the common stock on the contract basis of 75 per cent to Mr. Jones and 25 per cent. to Mr. Winder.

ILLINOIS

Carlinville—The large mines of the Standard Oil Co. here have opened with about 90 per cent. of the miners at work. During the strike a number of the miners moved from Carlinville, and it will take time to bring the force up to normal.

Moweaqua—Miners reporting at the Moweaqua mine have been informed that there would be no work until mine operators are allowed to charge higher prices for coal. F. A. Schafer, owner of the mine said that he could not afford to continue operation if he were forced to pay a 14 per cent. increase in wages, but could not increase selling prices. He wired the Fuel Administration at Washington, explaining the situation, asking the right to increase prices. About 150 men were employed.

Carbondale—Movement of coal from the southern Illinois coal fields on the St. Louis division of the Illinois Central R. R. recently was the heaviest in the history of the road. The great increase in coal output which immediately followed the strike of the miners caused a great revival of business on the road. All the mines are working full capacity, much of the coal moving to Chicago and to northern Illinois, as southern Illinois was well stocked with coal during the strike. On one day recently 1400 cars of coal were handled on this one railroad. The Illinois Central has taken on many additional trainmen, brakemen and firemen.

Springfield—Coal production in central Illinois for the year 1919 will run approximately four million tons short of that of 1918. There have been two important strike eras, one the great national strike and the other fostered by an insurgent element of the state miners' organization. Another reason for the decreased production was the failure of consumers to lay in their winter supply of coal during the summer of 1919. More than 26,000,000 tons of coal were mined in central Illinois during 1918. The production of the 80 mines affiliated with the central bureau, amounted to 18,091,008 tons. The remaining tonnage came from the shafts operated by the railroad companies. There are several railroad mines in the vicinity of Springfield which are operated by railroads, among them being the Divernon Coal Co.'s shaft at Divernon, and controlled by the Illinois Central and the Superior Coal Co.'s shaft at Gillespies, operated by the Northwestern. Approximately 25,000 miners are employed in central Illinois shafts. They represent 31 nationalties, with Americans born, including those of the colored race, ranking first. The Italians rank second, Austrians third, Germans fourth, Lithuanians fifth and English sixth.

KANSAS

Lawrence—The prize coal producing crew among the volunteers in the strip pits in the Kansas field came from the University of Kansas. The Kansas Agricultural College was second in production. The students from the University of Kansas manned Carbon No. 2 pit in Cherokee County. John Crawford, State Labor Commissioner, reported to Governor Allen that University of Kansas students produced 51 of the 170 cars produced by volunteers in the Crawford-Cherokee strip pits. Governor Allen is sending to each member of the college crews, which helped in the emergency, a personal letter of thanks and greeting from the state for the work done in the coal fields.

INDIANA

Indianapolis—The Rowland Powder Collieries Co. is to begin the extensive development of its extensive acreage of coal lands in Owen, Greene, Sullivan and Clay Counties. New capital to the extent of $900,000 was recently issued to Indiana, Ohio and Pennsylvania investors.

LaFayette—The Monon railroad has reported freight business for a recent week the heaviest in its history. For the week in question this company moved 13,651 loaded cars as compared with 7486 during the same week in 1918. The company moved 5265 empties during the week, 75 per cent. of which were coal cars and which were sent to coal mines and stone quarries on the Monon railroad in southern Indiana.

ARKANSAS

Fort Smith—Refusal to permit Thomas H. Shaw to inspect their mines, as state mine inspector, caused Mr. Shaw to close three more mines of the Central Coal and Coke Co., at Huntington. This makes seven Central mines in this vicinity which Shaw has closed. About 1200 miners are affected. The Central company refuses to recognize Shaw as mine inspector as a result of his removal from office by Governor Charles H. Brough. Shaw contends the governor is without power to remove him. Nine Central mine officials have already been fined from $50 to $100 by justice courts for their refusal to allow Shaw to inspect the mines. Governor Brough has called upon the state board of mining engineers to revoke Shaw's certificate of qualification as mine inspector. The Central company has headquarters at Kansas City.

Industrial News

Hazard, Ky.—The Midland Mining Co., has increased its capital from $190,000 to $300,000.

Williamsburg, Ky.—The High Splint Coal Co., has increased its capital from $300,000 to $400,000.

Whitesburg, Ky.—The Peerless-Elkhorn Coal Co., of Elkhorn City, has been incorporated by J. B. Ramey, Cora Ramey and others, with a capital of $100,000, and plans active development.

Sheridan, Wyo.—The Peabody syndicate of Chicago has purchased and assumed control of the seven coal mining properties in Sheridan County. The consideration was said to be about $7,000,000.

Cincinnati, Ohio—The Southeastern Coal Co., has been chartered with a capital of $25,000 to mine and sell coal. The incorporators are Walter A. Knight, Carl Phares, Lewis M. Hosea, Daniel J. Butler and Norma D. Berger.

Youngstown, Ohio—The Essential Coal Co., which was organized by Youngstown business men to operate an abandoned mine near this city, recently dumped 20 tons of coal on the principal street corners for the benefit of the needy. Police officers were used to see that only the needy were supplied with fuel.

Piedmont, W. Va.—The Kalbaugh Coal Co. has been incorporated with Dr. Z. T. Kalbaugh, as president and T. F. Shaffer, Cumberland, Md., secretary and treasurer. The company has already started to develop a mine on the old Kalbaugh farm, near Barnum, W. Va.

Columbus, Ohio—The Ganaden-Goshen Coal Co., has been chartered with a capital of $300,000 to develop a large coal tract in the Hocking Valley. The incorporators are S. R. Yoacum, L. C. Schaferm, George L. Stephenson, W. J. Eckart and Fred Anthony.

Charleston, W. Va.—Mines in Nicholas and Clay Counties, W. Va., will be operated by the Concord Coal Co., which has just been formed, having a capital of $100,000. It is understood construction work will be begun reasonably soon on preliminary development work.

Pottsville, Penn.—The Hillvein Coal Co. recently incorporated with a capital of $50,000. This concern is a river operation at Gordon, Schuylkill County, and is now negotiating for a $60,000 washery. The president of this company is Frank McLaughlin and the treasurer J. A. Dolphin.

Yeager, Ky.—The Ford-Elkhorn Coal Co., in Pike County, is understood to be arranging plans for the development of additional mining properties. Considerable new equipment will be installed for this purpose, and it is understood that the machinery will be electrically operated wherever possible.

Charleston, W. Va.—Philadelphia capitalists will undertake extensive coal-land development in the Warren district of Upshur County, W Va. They have obtained a charter for the Philmont Coal Co. The capitalization is $100,000. The Phiadelphians include Llewellyn O. Knipp, George H. Grove and M. F. Patterson.

Williamson, W. Va.—The Himler Coal Co. has changed hands, after being in operation for the last two or three years, the purchasers being John Matta, of Brownsville, Penn., and associates. The operation of the Himler company is at Himler in the Kenova-Thacker field on the Norfolk & Western Railway.

Bluefield, W. Va.—With a view to specializing in the export and bunker trade, the Virginia Smokeless Coal Co., it has been announced here, has established a sales office in New York City, with Benoit D. Weill as manager of the new branch. The company has plants in both Virginia and West Virginia.

Cincinnati, Ohio—The R. H. Elkhorn Coal Co. was incorporated with an authorized capital of $50,000. The incorporators are: J. M. Hamilton, president; D. E. Richards, treasurer; George V. Richards, secretary; F. R. Bayless and Walter E. Doll. The company will operate mines in eastern Kentucky near Pikeville. Its principal office will be in Cincinnati.

Charleston, W. Va.—While the Crown Hill Coal Co., with an operation at Crown Hill, already has mines in operation and is mining coal in the Coalburg seam, the company is making arrangements through the installation of a small plant in addition to the one now in operation to produce coal from the Cedar Grove seam. The Crown Hill company is said to be owned by the Richmond, Fredericksburg & Potomac R. R. Co.

Birmingham, Ala.—The Richardson, Phenix Co., of Milwaukee, Wis., lubricating engineers and manufacturers, announces the opening of an office at this place with James D. Scruggs as district manager. Mr. Scruggs knows the South, its people and its industries and has had a broad engineering experience in all matters connected with the efficient and economical lubrication of machinery in general.

Louisville, Ky.—Representatives of the Louisville & Nashville R. R., have asked for a reduction in rates from eastern Kentucky points to stations on the Manistee & Northwestern R. R., stating that present combination rates are prohibitive. A decrease of 80 to 85c. a ton was asked, with a rate of $2 a ton net from the mines to Anderson, Ind., and $2.10 to Muncie, Yorktown and other cities.

2 by the Hocking Valley Ry. officials that during the first three days of the week, starting Jan. 5, no coal consigned to shippers which are reached through the Toledo gateway would be accepted. This rule was made to aid in relieving the congestion. Also it is announced that no consignments of coal to Detroit shippers will be received without a special permit secured from the terminal distributor in Detroit.

Beckley, W. Va.—Smokeless coal in the Raleigh field will be mined by the Crab Orchard Fuel Co. of Crab Orchard, W. Va., this company having just been organized by Raleigh County citizens. Operations are to be on rather an extensive scale as indicated by the new company's capitalization, $350,000. Behind the new company are Prince E. Lilly, John Hornbrook, R. C. Hornbrook and E. F. Hornbrook, all of Lillybrook; C. E. Lilly, of Fireco, W. Va.

Philadelphia, Pa.—The Emmons Coal Mining Co., of West Virginia, Inc., with offices in the Land Title Building, of this city, has let a contract for its new tipple at Bayard, West Virginia, the equipment of which will be furnished by the Roberts & Schaefer Co., of Chicago; it will consist of a Marcus picking table screen, Roberts & Schaefer shaker loading boom, together with all transmission machinery and refuse disposal apparatus in connection with the plant.

Clarksville, Ark.—A new mining company has been organized here under the name of the Clarksville Anthracite Coal Co. The new company will open up a mine in the Spadra field, where it has a lease on 280 acres of a 40-in. seam of coal. W. N. Cunningham, formerly connected with the Smokeless Coal Co., is president, and Guy Johnson, secretary and treasurer. The other members of the company are J. H. Brock and Charles and Leslie Bryant.

Wayne, W. Va.—The Buterick properties, consisting of about 2000 acres of coal land in Wayne County, owned by Elihu Root and wife, of New York, and James M. Buter, of Boston, were sold on Friday, Dec. 26, to L. A. Tinder and L. W. Hamilton, of Charleston, W. Va., for the sum of $40,000. The land is on Laurel Creek and the right fork of Camp Creek. The purchase of the Buterick properties is thought to presage early development in the Stonewall district, of Wayne County.

Dayton, Ohio—The Best Coal and Coke Co., has been incorporated with a capital stock of $200,000, according to a dispatch from Columbus, Ohio. Stock of the Best Coal Co. (with offices in the Reibold Building) was sold to the new company by John H. Best, sole owner. The incorporators are: A. F. Aker, of Pitsburg, Ohio; Russell V. Green, formerly with the Baltimore & Ohio R. R., at the Dayton offices; James Anderson and Robert H. Ball, of the Ball Coal and Mining Co.

Bluefield, W. Va.—The Carter Red Ash Coal Co. has changed hands, having been taken over by the S. L. Matz Coal Corporation. The plant of this company is at Raven, Va. Under the new owners extensive improvements are to be made, including the installation of a large amount of equipment. It is expected by the company that it will be jossible to increase the production from about 300 to about 1500 tons a day. The Matz Corporation is headed by Samuel Matz of Bluefield, W. Va.

Logan, W. Va.—Work is to be started at once, it is announced, on the new plant of the Faulkner Coal Co., at Mallory, Logan County, where the company expects to spend about $150,000 in development work. It will require a period of about six months to have the plant in operation. The company estimates that in time it will be possible for it to produce about 200,000 tons per annum. The company not only expects to install modern mining machinery, but also to erect a number of dewellings for miners.

Williamson, W. Va.—All doubt as to the sale of the Red Jacket Consolidated Coal Co.'s mines, at Red Jacket, in the Mate Creek region, and as to the identity of the purchaser, has been dispelled by the announcement that M. A. Hanna & Co. has secured control of the Red Jacket properties including large acreages of coal on Mate Creek, in Mingo County. It was rumored for a time that either the United States Coal & Coke Co. or the Solvay Collieries Co. was buying the Red Jacket holdings. The property is on the Norfolk & Western Ry.

Morgantown, W. Va.—Rumors were in circulation here during Christmas week to the effect that the Bethlehem Steel Corporation had completed a deal for the purchase of the Morgantown & Kingwood Railroad, a coal road operating between Morgantown and Kingwood, but there has been so far, no confirmation of such a rumor, although there has on the other hand been no denial. The understanding is that the active management of the railroad will be under the direction of the management of the Penn Mary Coal Co., a subsidiary of the Bethlehem concern. Of course the deal cannot be consummated, if the rumors be true, until after the railroads are returned to private control. The purchase of the railroad by the Bethlehem company has always been regarded as the logical sequence of the sale of the Elkins Coal and Coke Co., by the Elkins interests, since the railroad was always operated by the same interests and for the purpose of developing the rich Decker's Creek country.

Charleston, W. Va.—While the number of new coal companies launched in West Virginia during the month of November was not quite equal to that of previous months, yet out of a total of 69 resident corporations and charters, 12, or almost one-fifth of the entire number, were coal corporations. The total authorized capital represented by the 12 companies was $2,975,000. Considering the fact that conditions during November were not conducive to inviting the investment of capital in new coal enterprises, the number of companies formed is generally regarded as being most encouraging. In the list of prominent new companies organized during the period stated were the following—the authorized capital stock of each being given: Fairmont City Gas Coal Co., Fairmont, W. Va., $300,000; Soper-Mitchell Coal Co., Morgantown, W. Va., $250,000; Hazy Eagle Coal Co., Charleston, $200,000; Sprague Land Co., Tams, W. Va., $250,000; King Fuel Co., Logan, W. Va., $500,000; Lincoln Smokeless Coal Co., of Logan, operation in Fayette County, W. Va., $600,000; Imperial Smokeless Coal Co., Charleston, $600,000.

Foreign News

Valparaiso, Chili.—Several new coal deposits have been discovered in Southern Chili, according to reports published in Las Ultimas Noticias recently. Reports indicate that 400,000,000 tons can be mined, and it is said that development is under way.

Calgary, Alta.—Report from Calgary and other points on the prairies are to the effect that the shortage of fuel is likely to be felt more or less seriously in the western province of Canada this winter. Describing the situation in Calgary a writer points to its incongruity: The Drumheller and Three Hills coal fields are to the east; the Lethbridge and Crow's Nest coal fields to the south; the Bankhead and Canmore mines to the west, and the Brazeau and Edmonton fields to the north. Even with such conditions Calgary, having only 75,000 population, finds it hard to get enough coal for ordinary domestic use in cold weather. Of course the trouble is that the one big Union strike of last summer prevented the accumulation of surplus stocks, and now that the demand is heavy, the coal is being shipped straight from the mines to the hands of the consumer. The city of Calgary is expected to undertake the introduction of a system both to increase the production and facilitate distribution.

Nanaimo, B. C.—The Wakesiah mine of the Canadian Western Fuel Co., which was opened up recently near here, is producing some 200 tons of coal daily. This mine has not been doing much until lately and the results now being obtained are considered satisfactory. The output, however, evidently is not to be allowed to remain at that level, it being the company's intention to bring it up to 600 tons a day in the course of a few weeks. Figures issued by the Canadian Western Fuel Co. indicate that, whereas a few years ago the bulk of Uanaimo's coal was marketed in the United States, today the reverse is the case. In 1917, 41.5 per cent. of the coal mined by the Canadian Western Fuel Co. was sold in British Columbia. In 1918 the percentage had risen to 58.5 per cent. and for the first ten months of the present year, 70 per cent. of the output was sold in the province. In November when the big coal strike started in the United States, this percentage was further increased. Instead of shipping more coal to the other side, as might have been expected under the circumstance, the company sold 75 per cent. of its output in the province. The only coal going to the United States from this company's mines is coal for which contracts were made last summer, when there was not enough business in the province to take care of the output and the mines had to be kept running by seeking foreign contracts. Before the war the company sold most of its coal in the United States, but when the war started this policy was changed, so that when the war ceased it found itself without foreign markets and more output than it could sell to the domestic trade. This resulted in the seeking of contracts in Seattle, Wash., which since have been retained.

Personals

H. A. Samcke, of New York office of the Consolidation Coal Co., has been appointed manager of this office.

G. A. Austin has been designated as acting assistant superintendent of the Marytown and Big Sandy plants of the Solvay Collieries Co.

Rex. L. Tomb, formerly buyer for the Black Band Fuel Co., has been appointed manager of stores for the Raleigh-Wyoming Coal Co.

A. E. Trumbare has just been appointed manager of the Export Department of the Consolidation Coal Co., with headquarters in New York.

Elmer H. Finch, geologist, has recently assumed duties of Chairman of the Mineral Division, Land Classification Branch of the United States Geological Survey.

F. E. Gould has been named as superintendent of the Lehigh plant of the Jamison Coal and Coke Co. He succeeds P. F. Shamblen, resigned. The appointment became effective the latter part of December.

J. E. Parsons, according to an announcement recently made, has been appointed manager of the Philadelphia office of the Consolidation Coal Co. Mr. Parsons was formerly manager of the New York office.

C. B. Crerding was recently appointed superintendent of the Maryd colliery of J. S. Wentz & Co., in Schuylkill County, Pa., succeeding Philip Mayo, resigned. Walter Schott has taken the position of mining engineer at this colliery.

C. P. Munch has been appointed general manager of the New River Collieries Co., it has been announced by John A. McGowan, the president of the company The new general manager will have his headquarters at Eccles, W. Va.

Thomas M. Paul has been named superintendent of the Carlinville properties of the Standard Oil Co. He is a practical miner and a mine man of wide experience. He has held this position before, having resigned from it only last summer.

W. H. Kramer, it is announced, has been appointed manager of the Pennsylvania division of the Consolidation Coal Co., succeeding S. Steinbach, who recently resigned to become the manager of production of the Penn Mary Coal Co. in West Virginia.

J. E. Sale, chief engineer of the Solvay Colliery Co., has severed connection with that company in order to engage in business as a consulting engineer, at Bluefield, W. Va., where he has formed a partnership, the engineering firm being known as Leall & Sale.

David E. Parker, of Hillcoke, Fayette County, Pa., has resigned as superintendent of the Isabella plant of the Hillman Coal and Coke Co., effective Jan. 1, and will move to St. Clairsville, Ohio, where he takes charge as general superintendent of the group of mines of the Clarkson Coal Co., of Cleveland, Ohio.

Carl A. Baer, engineer, announces that he has formed a partnership with Merritt T. Cooke, Jr., who prior to the war was a member of the firm of Stuart, James & Cooke. The business of the new concern will be conducted under the firm name of Carl A. Baer & Co., engineers, with offices in the Land Title Bldg., Philadelphia.

Harry Whyel, of Uniontown, Pa., with large coal and coke interests, principally in Fayette County, Pa., is said to have recently taken action to dissolve the Sewickley Creek Coal Co., of which he is president. This company has been operating in the Irwin gas coal basin in Westmoreland County, Pa., and the plant will be dismantled on account of the exhaustion of the coal on this property.

Alva Gilliland, of Braznell, Fayette County, Pa., has resigned as superintendent of the Snowdon Coke Co. He has purchased an interest in and will take charge of the operation of the Franklin Coke Co., at Tippecanoe, Fayette County, Pa. This plant is on the Pennsylvania R. R. between Brownsville and Uniontown. The company is mining the Pittsburgh seam and has 30 beehive coke ovens on the property.

C. W. Clark has been named as assistant general manager of the Standard Oil mining properties here. He is a brother of E. M. Clark, formerly general manager of the Carlinville & Wood River industries of the Standard Oil Co. Mr. Clark is a mechanical and an electrical engineer and had charge of installing all of the electrical work in the new Carlinville mines of the Standard Oil Co. He has been residing in Carlinville for about one year.

A. C. Fieldner, supervising chemist, Bureau of Mines Station, at Pittsburgh, Pa., recently read a paper on Fuel Analysis, at the annual meeting of the New Jersey Clay-Workers Association and the Eastern Section of the American Ceramic Society, held at Rutgers College, New Brunswick, N. J. The speaker gave a comprehensive resume on this subject, covering such matters as the sampling of coal, methods of analysis, the determination of heating values and fusibility of ash. He concluded with a survey of the fusibility of the ash of American coals from such sections as Pennsylvania, Virginia, West Virginia, Ohio and Tennessee.

Obituary

J. H. Wheelwright died Jan. 7 at Paris, France. Mr. Wheelwright was president of the Board of Directors of the Consolidation Coal Co., and formerly president of the National Coal Association. The news is a distinct shock to his many friends in the coal industry. Details are lacking as the paper goes to press.

John H. Reilly, aged 25, superintendent of the Nellie mines of the Reilly-Callaghan Coal and Coke Co., Georges Township, Fayette County, Pa., was killed on Dec. 31, 1919, by a coal hopper car he was assisting to load. He slipped and fell and, before other workmen could drag him from the tracks, the car passed over his body. He was the son of W. J. Reilly, president of the company.

D. M. Evans, a mine foreman at the Truesdale colliery of the Delaware, Lackawanna & Western Co., at Nanticoke, was instantly killed by a fall of rocks recently. He was 40 years old and had been a foreman at the mine for ten years. He was making a tour of inspection at the time and stopped in the chamber of a mine to talk to him. The roof gave way without warning and he was buried under tons of rock and coal.

Harry McKeon Connor, a consulting mining engineer, of Scranton, Pa., died suddenly at Canon City, Colorado, on Dec. 1, and was buried in Scranton on Dec. 6. He was 44 years of age and leaves a widow and three young sons. At an early age Mr. Conner began work on an engineering corps at Winton, Pa., thence filling the position of engineer of one mine and later of several plants. In 1903 he went to the bituminous region of western Pennsylvania as superintendent of a mine; in 1906 he accepted a similar position with the United States Gypsum Co. Virginia as chief engineer of a group of mines. In 1910 and during subsequent years Mr. Conner has been engaged in professional work connected with coal mines which took him to many of the coal regions of the United States. Within the past two years he has advised on the development of coal properties in Brazil and was in touch with such activities in other foreign lands. Mr. Conner was born in East Mauch Chunk, Pa., and was a brother of Eli T. Conner, also of Scranton, and a mining engineer whose specialty is managerial consultation on coal mining.

Publications Received

Power in Alberta—Water, Coal and Natural Gas. By James White. Commission of Conversation, Ottawa, Canada. Illustrated; pp. 32; 6½x9¾ inches.

Hennepin and La Salle Quadrangles. By Gilbert H. Cady. State of Illinois Department of Registration and Education Division of the State Geological Survey. Bulletin No. 37. Illustrated; pp. 136; 7x10¼ in.

Trade Catalogs

Westinghouse Underfeed Stokers. The Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa. Circular No. 1615. Pp. 36; 8½x11 in.; illustrated. Complete description of the stoker and detailed information about installations.

Davis-Bournonville Lead Burners Outfits. The Davis-Bournonville Co., Jersey City, N. J. Pp. 6; 8½x11 in.; illustrated. Description of apparatus for welding lead sheets, storage battery connections and all lead work. Notes as to its use.

Waterbury Rope. The Waterbury Co., 63 Park Row, New York City. General catalogue and price list. Pp. 220; 3½x6¼; illustrated. This handbook is a ready reference on information applicable to all hard fibre cordage, wire rope and music wire.

Coming Meetings

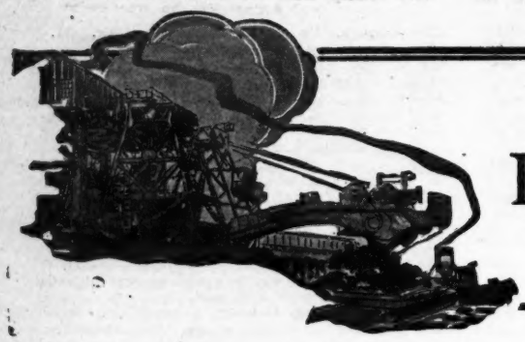
Northern West Virginia Coal Operators' Association will hold its next meeting Feb. 10, 1920, at Fairmont, W. Va. Secretary, George T. Bell, Fairmont, W. Va.

National Conference of Business Paper Editors will meet at the Astor Hotel, New York City, Jan. 16, 1920. Secretary, R. D. Hall, 36th St. and 10th Ave., New York City.

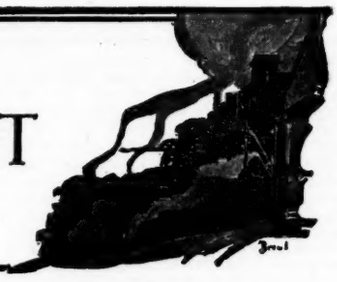
American Institute of Mining and Metallurgical Engineers will hold its next meeting Feb. 16 to 19, in New York City. Secretary, Bradley Stoughton, 29 West 39th St., New York City.

The Wholesale Coal Trade Association of New York will hold its next meeting Jan. 20, 1920, at the Whitehall Club, New York City. Secretary, Charles S. Allen, 1 Broadway, New York City.

The Rocky Mountain Coal Mining Institute will hold its winter meeting Jan. 19 to 22, 1920, at Denver, Colo., with headquarters at the Albany Hotel. Secretary, F. W. Whiteside, Denver, Colo.



MARKET DEPARTMENT



Weekly Review

Production in Bituminous Districts Shows Marked Change for Better—Coke Market is Unusually Brisk Operators Hoping for Best from Investigation Committee

COLD weather has briskened the demand for the domestic sizes of anthracite, and in New York City operators are sold up for weeks in advance. This is to be expected for the production in 1918 was 99,000,000 tons and in the present year it has been but 86,000,000 tons. There is no reason for panicky conditions, however, for Buffalo, where a lot of independent anthracite coal has been sold at a big premium, is puzzled to find a place for it.

Production in the bituminous mines increased this week. It is slowly approaching normal despite holidays and car shortages. However, with a generally recognized holiday, the New Year, the railroads had a chance to pick up, but the condition is not even yet satisfactory. It is cheering to note that practically all of the mines in Illinois and Indiana were working in the past week and that they added materially to the production. The operators are protesting against the price they are allowed to charge, and many will doubtless be obliged to shut down if relief is not afforded them.

The difficulties of the operators in supplying the demand for coal are intensified by the railroads requiring that where the operators are behind in their railroad orders the operators shall give the railroads their coal first and leave manufacturers and other users without. Unless the railroads get what they desire, it is feared that they will resort again to the commandeering of coal.

Coke producers are extremely wrathful at those few violators of the law who are charging an undue price for coke. They are determined to bring them to time by legal process. The scarcity of coke has made the market unusually brisk, the purchasers being convinced that coke will be scarce for some time to come.

Exporters are receiving more attention from the producers of bituminous coal, for they will pay a better price than can be received in the home market. The quantity of fuel that has been shipped since the bunkering of coal was forbidden has been enormous and the shippers are well satisfied with conditions. From now on the output of coal should be above normal. Several operators would like to close down as their mines cannot be run at a profit at such wages and prices as now exist by Government rule, but they do not like to appear to disobey the orders of authority even when those orders are violative of common justice. The operators are hopeful of the results of the investigation commission. They feel sure that it will grant them an increase in prices, and they do not want to lose their men by closing down their plants. They argue that quite frequently with inadequate prices an idle plant is more costly than one that is working.

WEEKLY COAL PRODUCTION

From a report of the Geological Survey dated Jan. 3, 1920, the output of 8,621,000 brought the total production from the beginning of the year to Dec. 27, up to the figure of 451,618,000 tons. With three working days remaining this suggests a total bituminous output for the year 1919 of 458,000,000 tons. This is the smallest in any year since 1915. Compared with the 579,886,000 tons of the record year, 1918, it is a decrease of more than 121,000,000 tons.

While the Christmas holiday caused a drop in total production, the rate per working day during the week ended Dec. 27 was practically the same as that of the week before. The average for the five working days was 1,724,000 tons and this was 85.5 per cent. of the daily rate for the four weeks ended Oct. 25, which may be regarded as normal.

The average for the week, 85.5 per cent. normal, is not, however, a true measure of the extent to which operations have been resumed in the union districts, for neither the day before Christmas nor the day after count as full working days. A better measure is found in the fact that on Monday, Dec. 22, the output was 103 per cent. of normal, or in the fact that compared with production at Christmas time of last year, the week shows an increase of over 2,000,000 tons.

The output of anthracite during Christmas week fell to 1,331,000 net tons, a decrease of 396,000 tons, or 23 per cent., when compared with the preceding week. The holiday slump was not as marked as last year, when the output of Christmas week was only 1,289,000 tons.

The total production from Jan. 1, 1919, to Dec. 27 amounted to 85,400,000 net tons. The three working days remaining may raise this figure to 86,225,000 tons for the year 1919.

The holiday slump carried the output of beehive coke down to 322,000 tons during the week ended Dec. 27. Compared with the preceding week this was a decrease of 58,000 tons, or 15.3 per cent. The decrease was felt in all districts. The active state of the coke market, however, is indicated by the fact that in spite of the holiday season and a restricted car supply, the production was greater than at any time from mid-April to mid-July last.

The total production of behive coke from the beginning of the year to Dec. 27 was 19,440,000 tons. Allowing for the working days which remain, this suggests an output of 19,650,000 tons for the year 1919. Production in recent years has been as follows (in net tons):

1913—33,585,000	1916—35,464,000
1914—23,336,000	1917—33,168,000
1916—27,508,000	1918—30,481,000
1919—19,650,000	

Competition of byproduct coke and the comparative inactivity of the steel industry during 1919 have thus resulted in the smallest output of beehive coke in many years.

Atlantic Seaboard

BOSTON

Market decidedly apathetic. Movement light via all routes. Operators confine themselves largely to contracts. Export ban lifted at Hampton Roads. Shippers query as to effect of releasing coal for overseas. Anthracite movement good. Signs of slackening demand.

Bituminous—The year opens with little interest in steam grades on the part of the buyer. New England steam-users are well supplied and it is difficult to see where any broad market can develop for several weeks to come. It is not unusual to find textile or other mills with reserves that will last until April or May, so generally foresighted have been most consumers in this territory during the past 18 months. There is a scattering inquiry for spot coal, but such request is practically all from small users and from retail dealers who are apprehensive lest mining or transportation be again interrupted.

Movement, however, continues very light. A large number of cars that had been held several weeks at destination have recently been released, and this is another reason why the market is apathetic. Water deliveries have been practically nil from New York and Philadelphia and yet there is no apparent anxiety in any quarter. From Norfolk receipts have been less than normal, but they have been sufficient to meet requirements of contractors. Notwithstanding what amounts almost to a certainty of higher cost coal next season there is apparently no effort to get forward shipments in volume.

The railroads have taken good care of themselves during the past 60 days, to judge from the number of cars of commercial coal confiscated, and while short car-supply and the lack of men prevail at the mines there is not likely to be any materially increased movement for the present.

Operators are, in fact, confining themselves largely to contracts. Spot sales are of course hampered by the Government price out of which the producer must pay the wage advance, and it is not to be expected that business will be sought on any such basis. "Smithing coal" is again heard from and certainly there will be other makeshifts to permit shipments on a renumerative basis, especially in the thin seam districts.

The ban against oversea shipment has now been practically raised, the announcement being made on Dec. 29 by the Railroad Administration permitting 50 per cent. of the tonnage that moved on export requisitions during October, this applying so far only to the Hampton Roads piers. The trade naturally expects, however, that export coal will be permitted to move via the Philadelphia and New York piers also within a few days. This will introduce another element into the price situation, for with $1.35 extra allowed on coal actually loaded into foreign vessels, and with a lot of tonnage due on high-priced contracts executed early in the year, there is bound to be a better movement to Tidewater. In time, if present mining conditions are continued, it may mean a better market for coal in our own markets.

There is some apprehension among Hampton Roads shippers over the number of steamers waiting for oversea coal cargoes. At one time it was said there were more than 100 of them on demurrage. Are coastwise vessels now to be detained waiting for foreign boats to load? No answer has yet been made to this question, although it is vital to coastwise shippers.

Anthracite—Domestic sizes are coming forward in such good volume that there is much less anxiety over the balance of the season. The demand for "premium" coal is now much restricted, and it would be no surprise to see the bottom drop out altogether, after a few weeks. There are still communities that will need current supplies for some time to come, especially if the weather continues cold, but in cities like Boston and Providence the edge is completely off the demand, except for steam purposes. The demand from householders has been insistent, but now it is slackening.

There is no call for steam sizes in any direction. The market lasted only long enough to enable retail dealers to move their surplus acquired in 1918, but not long enough to help out the producers to any measurable extent.

NEW YORK

Local anthracite market active with little coal to meet the demand. Chestnut coal easier. Weather conditions aid consumption. Demand for buckwheat strong. Concessions made to move barley. Retail prices advance because of wage increase. Bituminous market slow. Supplies at this tidewater low.

Anthracite—Good consumption temperatures added activity to the local market. Supplies, with the exception of the steam sizes, are about as low as at any time recently, and the shortage is felt severely by the local retail trade.

While the wholesale market was enjoying the holiday season the retail dealers were kept hustling to supply the demands of their customers. Receipts at tidewater were curtailed because of the holiday idleness at the mines, but the cars dumped at the local piers during the week exceeded those dumped the previous week.

There was not so much urgency for chestnut coal, but egg and stove were badly wanted, and pea coal was also scarce. A goodly tonnage continues to go westward and to New England. All sizes are made and many inquiries are received daily by the trade.

The steam sizes with the exception of barley, are in good demand. Buckwheat was the scarcest of the three sizes, and quotations were held near company schedule. Rice was also in fair demand with quotations firm. Barley was in over supply and concessions are necessary to move it.

There were 5618 cars of anthracite dumped at the various railroad piers in this harbor during the 7-day period ended Jan. 2, as compared with 4114 cars the previous week, an increase of 1504 cars. During December there were 22,660 cars of anthracite dumped here as compared with 23,331 cars in the previous month of November, and 26,261 cars in December of 1918.

The retail price of the domestic sizes including pea coal, were advanced by the dealers in Manhattan and The Bronx 50c. per ton on Jan. 1, to meet the increase in wages of $6 per week granted the employees of the dealers. The retail price of steam sizes was increased 25c. per ton and of bituminous coal 65c. per ton.

Bituminous—The situation has not improved. Coal is scarce at this tidewater and shipments are slowly coming in. Demand is strong for free coals, but there is little to be had, producers and shippers taking care of their contracts as far as possible.

Reports received from the mines as to the miners returning to work are not as satisfactory as expected. In some districts it is said that the men are back in fair numbers while in other districts the reports are not as favorable.

Operators complain of the poor car supply which they say prevents larger production. Because of the holiday season it is not expected that the movement of coal toward the seaboard will begin until the middle of the week, and it will be about a week later before the coal can be expected to reach its destination.

Locally, market conditions are unsatisfactory. The piers are lacking coal and deliveries are considerably delayed. The harbor is filled with empty bottoms and shippers complain of slow loading and frozen coal is causing much delay. Consumers are not suffering from the lack of coal, but they are ready to replenish their storage piles. The bunker business shows a gradual improvement.

Prices are holding firm. The trade does not expect any change in prices until the Fuel Administration relinquishes control of the industry. Operators are now receiving payment for the coal confiscated by the railroads, some of them having received their first checks last week.

Dumpings at the local tide water piers for the seven days ended Jan. 2 were 4492 cars as compared with 3017 cars the previous week. During December there were 13,829 cars of bituminous dumped here as compared with 16,679 cars in November of last year and 25,169 cars in December of 1918.

PHILADELPHIA

Anthracite consumption heavy due to weather. Retail demand all on stove and nut. Customers decline pea. This size expected to move later. Change of sizes comes up again. Dealers favorite. Retailers encouraged to make closer payment of bills. Big retail change coming. Steam sizes in moderate demand. Bituminous demand mostly on high grade fuels. Contracts customers get the best. Ordinary coals bring top prices. Car supply off.

Anthracite—That there is a heavy consumption of coal in this territory can be said with the utmost truthfulness, yet the demand on the retailers is but moderate when the wintry conditions are considered. To date there has been a full month of real winter weather, snow-fall, alternating with low temperatures. Because of the good deliveries all summer long the dealers are not being heavily pressed at this time by their customers. This should not be taken to mean that they do not have the orders for delivery, for such is not the case, but the consumer is still holding out for either stove or nut.

Most dealers had hoped with the coming of continued cold weather that they would be able to quickly move their stocks of pea, but such has not been the case. While good deliveries have been made of this size, yet the receipts from the shippers have been almost equal to the deliveries. Some yards have actually held pea coal orders with the shippers and many others would like to if it were not for the fear that they might be cut off entirely from receiving stove and nut.

All dealers continue to complain of the small tonage of stove and nut received recently, yet the operators maintain that the tonnage of these sizes sent here recently is well up to and in many cases beyond the average. Certain it is that no dealer is able to keep a supply in his yards, for they all have orders on their books to take up every pound as fast as it arrives.

The steam trade remains quiet for the time of the year. As has been the condition all season, the only real demand has been for buckwheat and this size has been about taken up during the past week, especially since there has been some curtailment of the output due to the holidays. It is believed though that this size will strengthen considerably before long. Rice and barley continue to be in only the most moderate demand and the huge piles of these sizes in the company storage yards are almost untouched to date.

Bituminous—There is a fair demand for steam coals in this market, but it must be said that the call is only for the higher grades, although the poorer grades are not as plentiful as they ordinarily are at this time of year. Most of the spot business is confined to the low grade coals and the shippers still ask the full Government price of $2.95 plus 15c. commission for this coal. Contract customers continue to get the bulk of the good coals, as that is the most profitable business at this time. The shipments into the city have been but moderate recently, as the car supply at the mines has fallen off quite badly.

There is also a slight shortage of the Fairmont gas coals, it being reported that heavy tonnages from this district are being taken by the railroads for fuel. However, this is not felt so much here, as cement plants and brick manufacturers, the heaviest users of these grades, are operating under a reduced schedule due to the weather conditions prevailing. At tide there is a fair amount of business in certain grades, but the car shortage has operated to hold back this trade. The lack of bottoms continues to check the export trade.

Lake Markets

PITTSBURGH

Car shortage continues to hold coal production in the Pittsburgh district at far below the rated capacity, production being at about 75 per cent. of capacity. There has been little improvement in the past week in production, but progress is being made.

There has been an ample supply of domestic coal for local territory and public service corporation and other essentials are well taken care of. The steel industry on the other hand still has some complaints. Mill departments previously in operation are kept going, but in some instances the opening of departments long closed, is delayed. By-product coke ovens are getting larger and larger shipments, but in several instances operations are still below capacity.

The coal market is extremely quiet, there being only very limited tonnages of free coal available, and full Government prices are obtained in all cases: Slack, $2.10; mine-run, $2.35; screened, $2.60, per net ton at mine, Pittsburgh district, with a 15c. brokerage allowance in some instances.

CLEVELAND

Ample supply of bituminous is coming in, while Pocahontas and anthracite receipts have fallen off. Production in the southern and eastern Ohio fields is near normal. A downward tendency in prices is noted.

Bituminous—Southern and eastern Ohio mines are reported practically as near 100 per cent. operations as can be expected in view of the labor and car shortage. Receipts of steam coal in the Cleveland district continue sufficient to meet all needs, but are not as large as would be thought. Last week a few plants were able to throw down a little bituminous; this week they have been glad to get their spot requirements. The situation, though, is by no means critical. It is believed that within ten days shipments will approximate normal. Steam-coal consumers are displaying great activity in seeking supplies, and it seems assured that the district will absorb in the next six months all of the steam coal it is allotted. Stockpiles that will be the largest ever are planned by practically all users.

By next week another price revision will have taken effect, and the tendency will be distinctly downward. Steam coal prices will have taken effect, and the tendency will be distinctly downward. Steam coal prices will not show a great deal of change, it is believed, though almost every grade will show a recession. No 8 Pittsburgh lump, now retailing at $7.20, will probably drop as low as $6.50. Other domestic bituminous coal may show a similar reduction. Demand for bituminous from apartment houses and other large consumers has shown a decided advance in the past week.

Pocahontas and anthracite—Receipts of both grades in the past week fell almost to nothing as only occasionally did a carload filter through. No suffering, however, was occasioned, but orders are piling up on dealers' books. Most dealers are entirely out of forked Pocahontas. On shoveled lump the

price has been cut from $10 to $8.95, while one large retailer has advanced mine-run Pocahontas from $7.40 to $7.75. Only contract anthracite now is coming through. Prices on all grades are unchanged. Coke demand, boomed during the shortage of the two smokeless grades, has diminished to practically nothing.

Lake Trade—Owners of vessels being operated in the coal trade between Lake Erie ports and Lake Ontario have met at Cleveland to discuss the question of higher rates for the 1920 season. The reduction made at the beginning of the 1919 season was too sharp, they claimed, and a committee was named to take the matter up with shippers of coal. The new rates, if any, would also apply to coal cargoes taken for Canadian points by the Emergency Fleet Corporation steamers built at Lake yards and taking coal cargoes on their way to the ocean.

Prices of coal per net ton delivered in Cleveland, with steam coal prices still largely nominal, are:

Anthracite—Egg, $11.75@11.90; chestnut, $12.00@12.20; grate, $11.75@11.90; and stove, $11.90@12.10.

Pocahontas — Forked, $10.00 @ 10.50; shoveled lump, $8.95; and mine-run, $7.75.

Domestic Bituminous — West Virginia.. splint, $7.50; No. 8 Pittsburgh, $7.20; Masillon lump,$7.50 to 7.60; canned lump, $10.50; and Coshocton lump, $7.50.

Steam Coal—No. 6 slack, $5.25@5.50; No. 8 mine-run, $5.75@5.90.

BUFFALO

Bituminous trade quiet. Shippers not satisfied with it. Unable to predict what is likely to happen. Cars scarce. Plenty of anthracite locally, but line trade scant.

Bituminous—The situation does not change much. The demand is pretty unsteady, some shippers reporting cancellations. The salesmen are out again and everybody is doing something, but there is an entire absence of the snappiness that so pleases the seller in any trade. It is going to take considerable time yet to get the trade back into line again. The miners do not work at a very brisk rate, but are expected to do better when the holiday feeling is out of the air. They are watching the turn of events and do not yet get down to real work.

As to the chances of the strike breaking out again, not so much is said as was at first. The trade is uncertain enough now and most shippers say that too much discussion makes it worse. The prices are not steady, but present quotations are expected to continue, and adding of the mere 14c. a ton does not seem to be uniform.

Car shortage increases, but it has not troubled the coal trade yet as much as it has some other branches of business, probably for the reason that the movement has been so light. However, it will be one of the worst features of the trade as soon as the coal output is normal again.

Canada is still buying bituminous coal at a slow rate. The consumers there bought more heavily than we did, on account of being farther from the supply, but it will be sometime before the demand will be active there. The refusal of our people to accept Canadian money at par hurts the trade seriously. Sometimes the discount is as high as 12 per cent.

Bituminous coal receipts by lake (coming from Sandusky, O., and the West Virginia mines for the Lackawanna Steel Co.) were 69,805 net tons, as against 112,840 tons in 1918 and 100,550 tons in 1917. Strikes cut down the business materially last season.

Anthracite—The city has all the coal it wants and the trade has been fairly dull during the past run of mild weather, but the return of low temperature will now increase the demand. Lake Shippers are busy looking after their rail-line trade, quite a little of which used to be part of the lake trade.

The shippers who were in the independent anthracite trade are disgusted, for as soon as the standard companies had shut off their lake shipments they filled the towns so full of coal that it was at once impossible to sell independent coal at a premium. In fact it is not easy to sell it at all. Predictions that the regular anthracite would always remain scarce induced some consumers to pay as high as $3 premium for the independent coal, but that time is over for the present.

Coke

Buffalo—The market is firm, but the demand is as light as usual. Coke is sold by bituminous jobbers in moderate amount, the bulk of it being bought of the producers direct. Quotations are $9.60 for 72-hr. Connellsville foundry, $8.60 for 48-hr. furnace, and $8 for domestic sizes. Stock and breeze coke are not saleable at present. The season's receipts of iron ore by lake total 4,837,981 gross tons, as against 8,707,599 tons in 1918 and 7,925,907 tons in 1917. The falling off is due to the steel strike and other labor difficulties. Stocks are ample in spite of it.

COLUMBUS

With reduced car supply and some labor shortage, operations in Ohio fields during the past month have been cut 50 to 60 per cent. of normal. Demand for all grades continues strong. Car supply is expected to continue short for some time

With a strong demand for all grades of coal, operators are bending every effort to produce a large tonnage. Shortage of cars coupled with labor shortage and some small strikes is reducing the output to slightly more than 50 per cent.

Some hesitation on the part of miners to return to work after the suspension and also the fact that some miners left for other lines of employment is causing a shortage of workers in many mines. Then again some of the miners were rather "soft" physically after the extended layoff and they were not able to put in full time until they were again in condition. Taking it all in all the output in all Ohio fields has been a disappointment to operators and shippers generally. The car supply is short and will continue until cars sent to the west and northwest are returned, but it will require weeks for many of these cars to be returned.

The demand for all grades is good. Domestic sizes are eagerly bought up as dealers are trying to keep ahead of their orders which are coming in rapidly. Consumers are in the market for larger amounts as their first supply is now exhausted. Outside of a few instances the stocks in the hands of dealers are rather low. Retail prices are firm at the levels which have prevailed. More uniformity in retail prices is noted as a large part of that sold now has been purchased at government prices. Hocking lump sells at $6@6.50, while mine-run is about $5.65@$6. Pocahontas is quite scarce and retails around $8.25. West Virginia splints are more plentiful and sell in the neighborhood of $7.50 for lump and $7 for mine-run.

Steam business is active in every direction with manufacturing plants in the market for larger stocks. Reserves in practically all instances have been exhausted and an effort is being made to build them up again. Rubber plants are taking a good tonnage and iron and steel plants are also buying better. Public service concerns are good purchasers and the same is true of schools and public institutions, and railroads are taking a larger amount than during the previous week.

No changes have been made in the government prices in the Buckeye State and the list still maintains. A calculation of the increase on contracts necessary to take care of the 14 per cent. advance in wages shows that 25c. should be added in the thick vein district of the Hocking Valley, 26c. in the Crooksville and Cambridge fields, 32c. in No. 4 Jackson seam, 35c. in No. 5 Jackson seam, 40c. in No. 2 Jackson seam and 26c. in the Pomeroy Bend field.

CINCINNATI

Taking in consideration the extreme cold weather here during the past week, the demand for coal was not as heavy as was expected. The demand for steam coal was fairly active. Government prices still prevail, with shippers getting only a limited amount for their regular business. There is little or no free coal to offer.

Coal is getting scarcer every day and if the car situation does not remedy itself soon a shortage will be felt. At the beginning of the new year less West Virginia coal was moving westward and more going eastward than had been the case during the greater part of December, owing to the removal of the export ban. As export trade brings a better price than producers are permitted to charge for domestic shipments the new export order was welcomed.

Much difficulty is being experienced by shippers in this locality in closing their books for the year 1919, owing to the large amounts outstanding for diverted and confiscated coal, the railroads not being as prompt in making remittances as they had indicated would be their policy.

Following a week of inactivity in the Kanawha region when not more than one-half of the usual tonnage was produced, production picked up somewhat during the early part of last week, averaging 80 per cent. The supply received in Cincinnati depends almost entirely upon the output of the Kanawha and New Region fields.

All grades of Kentucky coal are in demand both in and out of the state, industrial plants being in the market for supplies. The domestic sizes were not much called for, despite the severe weather. Pocahontas producers wound up the year under somewhat more favorable conditions than had marked the course of events during Christmas week, when operations were limited to about two days out of the entire week, with little or no coal being mined between Dec. 24 and 29, but conditions even at the outset of last week were not as favorable as might have been expected from a transportation standpoint, because despite general cessation of operations over a priod of several days railroads had not accumulated more than half enough empties for shipping needs. The bright spot, however, was the permission extended to resume export business.

The demand for coal is so great both from industrial and domestic sources that producers are hard put to take care of contract consumers, shipment of whose supplies were deferred in many instances during the strike.

All coal cars after being emptied here are re-routed to the western section of the country, consquently increasing the car shortage at the mines. Local coal men say that the car situation will soon be remedied. River recepts were far below normal.

DETROIT

A new difficulty besetting the Detroit coal trade is an embargo, declared Jan. 2, on anthracite and bituminous shipments.

Bituminous—Just as jobbers and wholesalers in the Detroit markets were beginning to feel that favorable progress had been made toward smoothing out the complications created by the recent strike of bituminous coal miners, the Railroad Administration becomes an active factor in the situation by placing an embargo, effective Jan. 2, on all shipments of anthracite or bituminous for delivery in Detroit.

It is explained that the purpose is to relieve the present freight congestion in Detroit and Toledo and to head off a more serious stoppage of freight. There are said to be about 5000 cars of freight of all kinds on the railroad tracks in Toledo destined for delivery in this city or to points beyond. When the embargo was ordered there were about 1000 cars of coal on tracks in Detroit.

While jobbers concede that there is no present danger of a shortage in the coal supply of this city, it is felt that a considerable disarrangement of schedules and much inconvenience is likely to be the outcome. There is a certain amount of flexibility in the embargo order, as provision is made for the issuance of permits to those who will give assurance that shipments will be immediately unloaded on receipt of cars. Even with this arrangement, jobbers say there will be a loss of from two or three days to a week's time in the delivery of coal to consignees.

Detroit dealers explain that the delay in unloading cars is due to the difficulty in obtaining men. There is normally a general shortage of labor and now the exteremely cold weather has made it practically impossible to get men to work in the open.

Anthracite—Inquiry for anthracite has been greatly stimulated within the last few days by the continuance of near-zero temperatures. With many household consumers coming into the market to renew their supply of fuel, the retail dealers find that the small stocks at hand are vanishing speedily. The embargo still further delays the delivery of shipments that have been arriving irregularly and in small amounts throughout the earlier part of the winter, affording dealers little opportunity to establish reserves to meet such a contingency as now exists.

BIRMINGHAM

Little change in market conditions over a week ago. Inquiry for steam coal fair, while the demand for the domestic sizes continues strong. Holidays curtail production considerably and forces at the mines are slowly returning to normal. Equipment sufficient to move all coal taken out.

There is no material change in trade conditions over last week. Inquiry for the steam sizes are only fair, but the movement on contracts continues heavy as the output

will permit, and there is little of the better grades of steam fuel available at this time, above the tonnage required for the contract trade. Little or nothing is being done in the taking on of new contracts, though there is some inquiry and effort from consumers to book such business, but due to the continued unsettled conditions affecting the industry, mines are not inclined to book further contracts at this time.

Mine workers are slow in returning to the pits after the holidays and the output is running from 60 to 75 per cent. normal this week. Although a shortage of equipment has been reported in other fields the supply in this district continues adequate for all needs.

LOUISVILLE

Production considerably off during holidays. Demand keen for steam coal, with domestic sizes also in good demand. Conditions improving somewhat at mining points.

Miners have been taking their usual holiday vacations regardless of the fact that they were out and lost time during the previous two months. Production at mines has been very low during the past week, but with better car supply and heavier tonnage will be increased during the first week of January.

Steam demand continues keen with operators meeting a ready market for every ton that can be shipped. Prepared sizes are also in good demand, as retailers' stocks are very low as a whole, and demand is somewhat better. Mild weather is resulting in light domestic stocks holding out longer than expected, while most domestic consumers are stocked to run through February.

Conditions at the mining points are slowly improving. Miners are finding that the operators have no intention to give in over the matter of closed shops and recognition of unions, and in many cases have been out so long that they cannot afford to fight further for the issue. Again, the wagon mines and small mines are not operating, which results in a larger demand for jobs as a whole.

Many reports are coming out of Middlesboro, which is a hotbed in the Southern Appalachian district, relative to operators discharging numbers of union men, because they are union men, but these reports are wild. The operators are not discriminating against union men, but are steadfast in the matter of refusing recognition. It is reported that 400 miners are still out at Middlesboro, and also reported that one mine has discharged 70 union men.

Indications are that for the next few weeks mines will be able to operate as close to capacity as supplies of labor and cars will permit, as the country needs a lot of coal, and leading operators are of the opinion that it will take months to load up the country to normal. No trouble in selling coal is predicted before April or May at the earliest, although domestic sizes may be a little slow in April.

Foreign Markets

TORONTO

Coal situation relieved. Supplies of bituminous coming forward. Trade continues quiet and likely to remain so.

The coal situation has been relieved by the arrival of shipments of bituminous coal in sufficient quantity to fill the present demands of the market which continue light. Consumers are apparently not anxious to lay in large stocks ahead now that the danger of a shortage seems to be over. The domestic trade is quiet and likely to continue so for some time, being mainly confined to the class of small consumers.

Quotations for short tons are as follows:

Retail—	
Anthracite, egg, stove, nut and grate	$12.75
Pea	11.25
Bituminous steam	9.00
Slack	8.00
Domestic lump	9.00
Cannel	12.50
Wholesale f. o. b. cars at destination—	
Three-quarter lump	6.50
Slack	5.75

Coke

CONNELLSVILLE

Car supply still limits production, and blast furnaces are short. No contract negotiations.

Conditions in the Connellsville coke trade continue to be dominated by the car supply, which is inadequate. There was reduced production in the week of Christmas, but not as great a reduction as usual, and the car supply in general seems to be loosening up. Blast furnaces, as a whole are very short of coke and would take much more than is being shipped. The furnaces require more coke for their current operations and would also like to stock coke against traffic interruptions during the remainder of the winter, since such stocks as were previously accumulated have been consumed.

There are only very occasional offerings of coke in the open market at the Government limits, and then only of small tonnages, the quality often being inferior. Negotiations on contract coke seem to be suspended entirely. While this may be due in large measure to the fact that contracts could not be made at above the Government limits another factor probably is, that consumers still uncovered do not expect as high prices to rule as they did a month ago, when some very high priced contracts were made. The market remains quotable at $6 for furnace and $7 for foundry, per net ton at ovens.

The "Courier" reports production in the Connellsville and Lower Connellsville region in the week ended Dec. 27 at 205,850 tons, a decrease of 41,334 tons.

Middle West

Middle west is suffering the severest cold snap of the season. Out in Iowa and Minnesota the temperature is considerably below zero. Retail demand is good. Transportation slows down, but we understand the Railroad Administration is doing all they can to get shipments through on record time.

Practically all of the mines in Illinois and Indiana are now working. All of them have business enough on their books to keep them running for some time to come. The demand for steam coal is very active, and growing more active every day. This situation holds true, also, on domestic coal, and those dealers who were so unfortunate as not to have substantial orders booked before the strike, are now out of luck. Fortunately, however, both the steam and domestic trade bought very heavily before Nov. 1, so the situation is not nearly so serious as it perhaps might have been.

Unlike last summer, the average operator out here is not worrying about getting enough orders on his books to run his mines, but now has something else to bother him. Ever since the mines resumed operations, some weeks ago, there has been a scarcity of cars, and this scarcity has grown until it is now quite serious. In fact, in some districts it is a very bad problem. The labor situation is far from settled, although generally speaking, the men appear to be contented and are working steadily in all of the most important operating districts. In some of the outlying coal fields of less importance, there have been some disturbances, but these interruptions have not been considered at all serious. There is no question, however, but that the coal industry will have a great sigh of relief when the labor situation is settled definitely for the next few years.

CHICAGO

Weather cold. Retailers well stocked. Railroads pay for confiscated coal.

Operating companies and jobbers in Chicago are just now beginning to receive checks covering coal which was confiscated or diverted by the Railroad Administration during the strike. There has been considerable red tape in connection with these confiscations and diversions, and even now a great many cars of coal, shipped in the middle of October, but confiscated in November, have not been paid for. This is working hardships on a great many companies, especially operating companies, as a considerable amount of money has been tied up in these confiscations and reconsignments.

The weather in Chicago has been extremely cold and predictions are that the cold wave will continue. It appears that the average retailer has enough coal in his bins to take care of his trade in a satisfactory manner as very liberal shipments of coal have been made to Chicago since the strike was temporarily settled. This cold weather can continue for some time without causing any hardship or suffering.

ST. LOUIS

Seasonable weather is creating a good market, although business is inclined to be slow. Car supply holds up good, but equipment is poor for this market. Railroad movement bad. Embargoes in effect. Steam demand easing up. No high grade coal available.

The local condition is one that is fairly satisfactory in a way, were it not for the easing up in the demand for screenings. While the Government price is being maintained, it is only a matter of time until this will break on account of the surplus tonnage. This refers to standard coal.

The demand for all grades of standard coal otherwise is good, but it is almost impossible to secure 6-in. lump. The railroads are taking more than their share of coal right now, but it is practically forced on them through the hopper equipment furnished, as these cars cannot be unloaded by the trade in the country. Consequently, there is a shortage of fuel in the country districts, and the railroads are thus enabled to get more than their usual tonnage.

Working conditions are good, with a plentiful supply of cars, although labor is still short. The mines are working full time up to the present, and in the Mt. Olive field similar conditions exist.

The Government prices of $2.55 on domestic sizes, $2.05 on screenings, and $2.35 on mine-run, with the jobber's margin of 15c. prevailing.

Conditions in the Franklin County field are good. There is a plentiful supply of cars, and while labor is short, the demand for everything exceeds the supply.

The country demand is exceptionally good, but cannot be taken care of from any of the fields, and in many places the trade did not have coal up to the first of the year since the strike. The weather is seasonable, with no strike, but weather that holds a continuous calling for fuel. There is no change in retail prices and in a general way the conditions are satisfactory to both retailer and operator.

Conditions in the St. Louis territory grew quite serious about the first few days in January on account of embargoes against shipments to country points placed by the Wabash, Missouri Pacific, Chicago & Alton, Missouri, Kansas & Texas and Burlington R. R., thus shutting off shipments to Iowa, Nebraska and sections of Kansas, and almost the northern half of the state of Missouri, which territory was already short of coal. The only reason given is lack of motive power.

Prices per net ton bituminous coal f. o. b. mine today as compared with a year ago are as follows:

Prepared sizes, lump egg, nut. etc.			
	2.55@2.70	2.55@2.70	2.55@2.70
Mine-Run	2.35@2.50	2.35@2.50	2.35@2.50
Screenings	2.05@2.20	2.05@2.20	2.05@2.20

Williamson-Franklin rate to St. Louis is $1.07½, other rates 92½c.

MILWAUKEE

Coal market is quiet. Dealers undisturbed by the prospective advance in the price of soft coal, as stocks are seemingly sufficient.

The coal market is quiet, with the demand fluctuating with vagaries of the weather conditions. Milwaukee is not worrying over the prospective increase of 30c per ton or more in the price of soft coal, because of the advance in miners' wages. There is seemingly sufficient coal on the docks to bridge over the season and dealers say they will not advance prices on the coal on hand. All coal that may come by rail from now on, however, will have to stand the increased price. Interior points which have been deriving their supplies direct from the mines of Indiana and Illinois by rail will be the sufferers.

A leading shipper reviews the situation as follows: "Practically all coal is contracted for in the spring. These contracts, enforceable by law, contain a provision under which the buyer is liable for any increase in the cost of production and these contracts the Government cannot change. Free coal, or coal not sold under contract is practically unobtainable. Existing contracts are sufficient to keep the mines in full swing, and operators are bound to fulfill their contracts."

In Connection with the Vast Improvements to be Made in the Industry—

in the immediate future one of our readers writes as follows:

"To keep thoroughly posted on up-to-date appliances, new equipment and latest improvements in mining machinery, the most reliable sources are the pages of *Coal Age*"

"We are installing some new equipment and we have recently purchased through the Advertising pages of *Coal Age* the following:

AIR COMPRESSOR
TIPPLE AND SCREEN
MOTORS
MOTOR GENERATOR SET
COAL CUTTERS"

The above is just another instance of an alert, progressive General Superintendent using the advertising section of Coal Age as a Buyer's Guide. In keeping abreast of the times, no progressive coal mining man can afford to overlook the advertising pages. Scanning the pages will not accomplish results ---most of the successful men in the coal mining industry read each issue dilligently and carefully from cover to cover.

"To serve" is the function of the Advertising Section, and as such each coal man should use it regularly—and read and reflect.

COAL AGE